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CACTUS AND SUCCULENT JOURNAL

Vol. XXIX SEPT.-OCT., 1957 No. 5

FIG. 65. *Coryphantha compacta* flowered by Majorie Shields in New Zealand (see pg. 119).

CACTUS AND SUCCULENT JOURNAL

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PRESIDENT'S MESSAGE

The loss on June 7, 1957, of Mr. Homer G. Rush is a blow to the Cactus and Succulent Society of America. His boundless energy and his long experience with the affairs of the Society made him the spark plug of the organization. He and Mrs. Ethel Rush made their intense interest in plants and in people with like interests the center of their lives, and it is small wonder that Mr. Rush's last word was "cactus".

His devotion to the Society was expressed in all its activities, as a long-time member of the Executive Board, chairman of the Research Board, organizer of conventions, lecturer, and an indescribably energetic answerer of letters from all over the world. He was President in 1954 and 1955. After his terms in the Presidency he continued to serve the Society as Junior Past President and Chairman of the Research Board. He organized the recent distribution of surplus material of new plants from the University of California Botanical Garden to members of the Society. The last distribution was completed by members of the Society while he was in the hospital.

Both Homer and Ethel Rush gave enormous amounts of time to the Society, and their home was the scene of numerous formal and informal meetings of those interested in cacti and other succulents. The Society owes the Rushes a debt beyond power of repayment, and it extends its deepest sympathy to Mrs. Rush.

Mr. William Taylor Marshall, President of the Cactus and Succulent Society of America from 1938 to 1941, passed away in August of this year. For many years he was President Emeritus of the Society, and during his last years he was Director of the Desert Museum of Arizona at Papago Park between Phoenix and Tempe. He was author of many publications on cacti and other succulent plants and particularly of a volume designed to bring Britton and Rose's, The Cactaceae, up to date. Mr. Marshall was one of the outstanding figures of the Society, and all its members owe him much for his outstanding contributions toward its development and success. His studies of succulent plants will be long remembered.

LYMAN BENSON, *President*

A NEW CEPHALOCEREUS

Dr. E. Yale Dawson has described a columnar cactus from Goias in Brazil—*Cephalocereus machrisii*. This new species was published in the July 15, 1957 issue of "Contributions in Science" of the Los Angeles County Museum. This species is named in honor of Mr. Maurice A. Machris, cosponsor with his wife of the 1956 Brazilian Expedition.

BOTANICAL CONGRESS

The Ninth International Botanical Congress will be held in Montreal, Canada, from August 19 to 29, 1959, at McGill University and the University of Montreal. The program will include papers and symposia related to all branches of pure and applied botany. A first circular giving information on program, accommodation, excursions, and other detail will be available early in 1958. This circular and subsequent circulars including application forms will be sent only to those who write to the Secretary-General asking to be placed on the Congress mailing list:

IX International Botanical Congress
Science Service Building
Ottawa, Ont., Canada

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

CHAPTER 4

We now come to the South American *Malacocarpus* group of four plants, three of which come from southern Brazil, Uruguay and Argentina, and the fourth from Colombia. All are in flower on this mid summer day in December. That one with the small clear yellow bloom and brownish red stigma lobes is *M. sellowii*. The larger yellow blossom with the red throat and red stigma lobes belongs to *M. corynodes*, and *M. erinaceus* has the largest flower of them all, canary yellow and clear like plastic with throat and stigma lobes both red. The fourth one from Colombia, *M. vorwerkeanus* has smallest flowers of the group

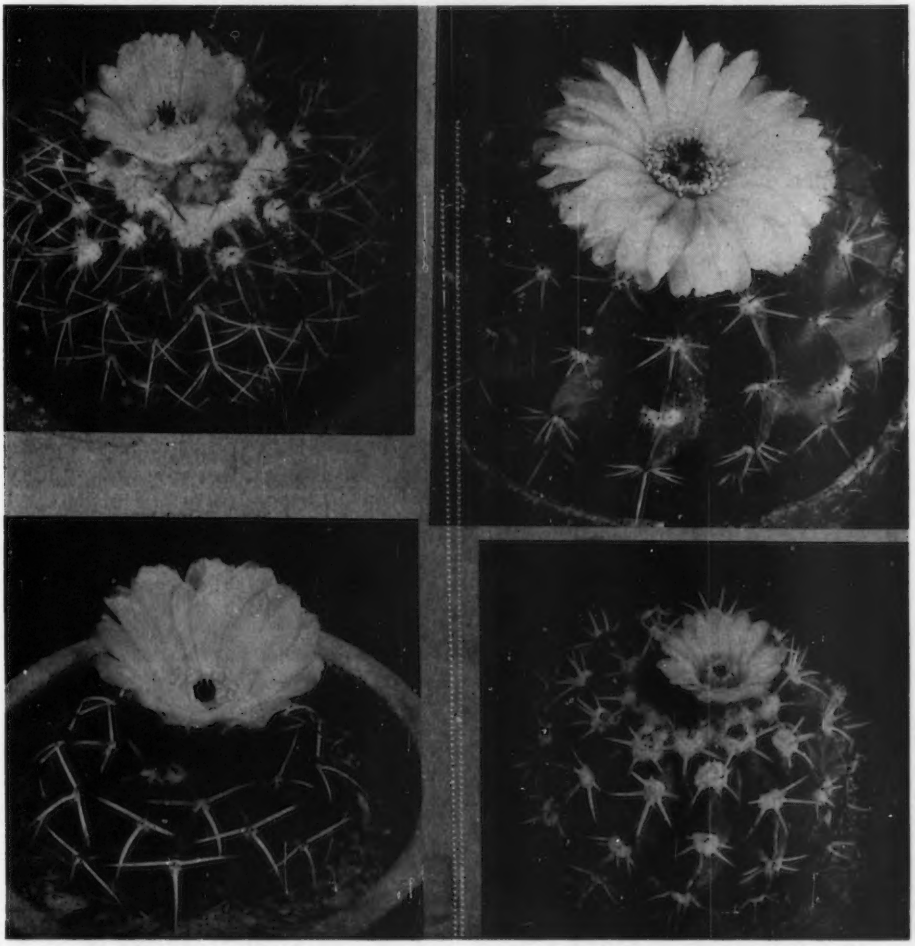


FIG. 66. *Malacocarpus sellowii* (upper left). *M. erinaceus* (upper right). *M. corynodes* (lower left). *M. vorwerkeanus* (lower right).

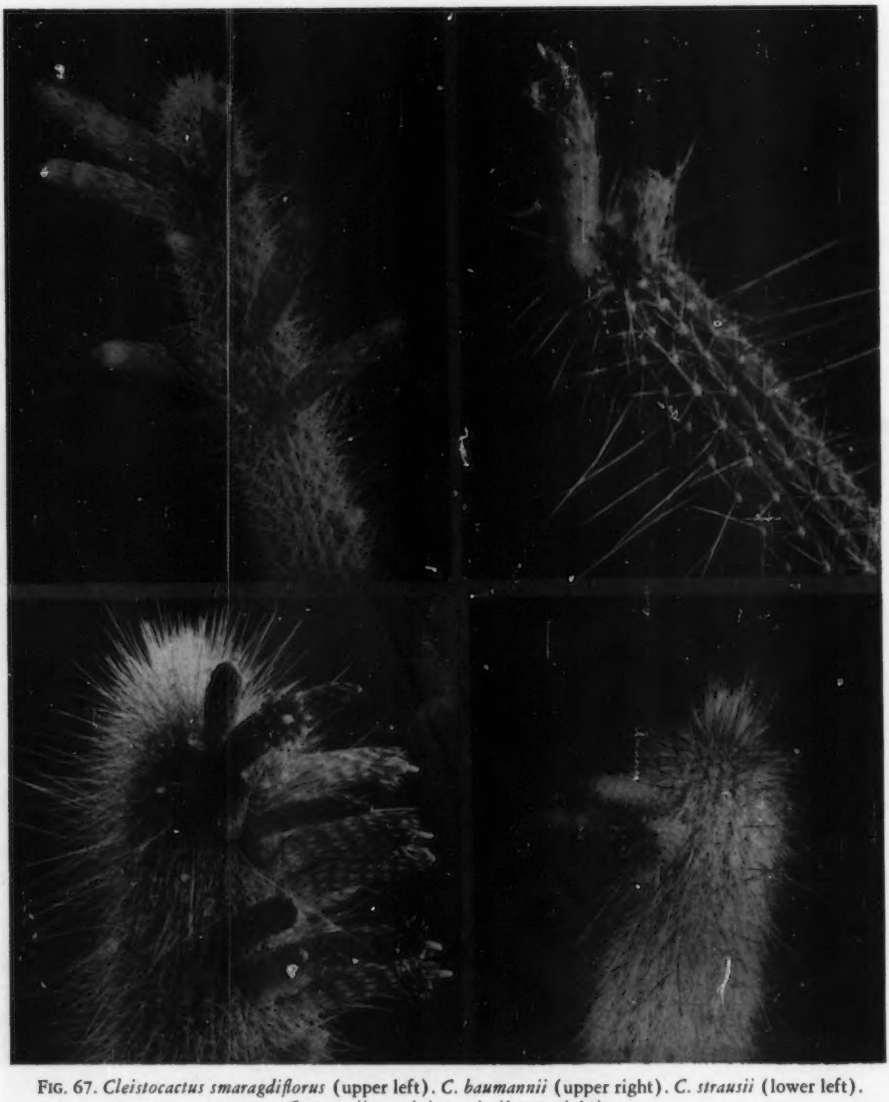


FIG. 67. *Cleistocactus smaragdiflorus* (upper left). *C. baumannii* (upper right). *C. strausii* (lower left). *C. strausii* var. *jujuyensis* (lower right).

but makes up for it in numbers, with blossoms of delicate primrose. The plants are most attractive; the depressed centres being filled with soft brown fur; the flowers pushing through look so snug nestling there with their furry mufflers round their throats. When they fade and the naked pink seed pods push through, they too are kept warm and cozy amongst it. This wool comes with the first flowering, and after that it is always there; the crown of the plant being full of it—like a cephalium. In some it is much darker than in others and adds much charm and attractiveness to these very desirable plants.

Further along we come to plants that are completely different. These are the very tall and slender *Cleistocactus*, with their strange flowers. They look just like cigarettes attached to the plants don't they? If one of them would produce a white flower with a red tip the illusion would be perfect. The plants are varying heights from 18 inches to over 3 feet, most of them clustering round the base. The queer tubular flowers appear

on the upper part of the stem. *C. smaragdiflorus* meaning "emerald flowered", has a tube about 2½ inches long of pinky red scales intermingled with white hairs. It is hard to say where the scales cease and the true petals begin; but as the end of the tube is reached the petals turn back and each one is tipped with green. The opening is so full of these green petals there is very little room for the stamens; you can just see them and that is all. These petals are straight, only the outer ones turn back their tips. *C. tupizensis* has a similar tube of orange red scales, but with a different opening at the top. Pinky red petals, like a little frill, entirely fill it, the yellow stigma lobes protruding. The outer petals turn well back, displaying the central frill to advantage. The flower *is* pretty. And so is the plant, with its long red-brown spines which look so gorgeous with the sun shining through them. The tube of *C. strausii* is salmon shading to tomato red as it reaches the top, where the turned back yellow-tipped petals surround the deep fuchsia central ones; the protruding stigma lobes are pale green. A lovely piece of colouring. Looked at full face, it is very beautiful indeed, like a many pointed red star, the yellow tips giving the impression of a light shining behind it. This is not the flower of the so called, pure white *strausii,* with short white bristles, now called *C. hyalacantha,* (mine is too small yet to flower) but the true species with long fine cream spines. Its variety *jujuyensis* is also a lovely plant with cinnamon spines instead of cream, and. being a variety, its flowers are similar. These all flowered in October, late Spring.

In November, *C. baumannii* and its var. *flavispinus* joined them. The former has orange-red scales forming the tube and ending with a row of yellow petals. Burnt pink anthers fill the tube, the orange filaments raising them up well beyond the petals at the back of the tube, while in the front they scarcely reach the petal tips. The pale yellow style with stigma lobes to match extends beyond the long filaments at the top of the tube. *C.* var. *flavispinus* I grew from seed, it being a stranger in a packet of *C. baumannii* seed, and now five years later it is flowering. The bloom is very like the parent plant, only it seems to be minus the last row of yellow petals, and is all the one colour. This plant has long cream central spines which point downwards. See those little spots of fluff on *C. anguinus?* They are buds and last Autumn when they first appeared I thought they were mealie bugs and tried to wipe them off with methylated spirits before discovering my mistake! I thought perhaps my treatment has burnt them as they did not flower with the others, but at last some of them have opened up now, in December. What a lovely colour they are too—real flame. The scales on the tubes look just like little flames leaping to the top. The tube bends at the bottom to enable the flower to stand upright. The petals inside the tube are orange, the stamens which graduate up the back of the tube and gather in a bunch just beyond the petals, are burnt orange, while the very long style which is well clear of the stamens is bright green.

The next group is an interesting one, containing both tall and globular plants, either in clusters or solitary. This genus is *Coryphantha,* mostly found in Mexico. I find them easy to grow, providing they are kept from mealies; they love them as much as I do! My plants are in a sunny position and seem to thrive on it. They flower during the three summer months, November, December and January, and even into February if the weather remains hot. *C. asterias* "like a star", referring to the star-like spine clusters, opened up this year's display early in November with a lovely palish pink bloom flushed with mauve. It looked like a pink frill with a ruched edge, the petals being so curled and feathered, and reminded me of the ruching I used to wear round my hat when I was a little girl. This one with the pale moon yellow bloom is *C. andreae.* What long narrow petals it has, and how sharply pointed. They shine like satin and have that clear plastic look. On the back petals there is a wide bronze mid rib. The golden stamens fill the throat and the pale cream stigma lobes float over them. It is similar to *C. asterias* in that it has solid green tubercules polished like jade, but the cream spines are heavier, tipped with brown and are in a different formation. December is its flowering time and this month also brings us *C. roederiana,* a very pretty little plant, with each tubercle crowned like *C. asterias* but in the centre of each is a stout, brown, hooked spine. The white flower has long narrow petals, slightly feathered; the filaments, also white, rising from the pale green throat are capped with bright golden anthers, while the stigma lobes rise above them like a little white palm tree.

But what about *C. neomexicana?* Isn't that a beautiful plant? The snow white spine clusters surround thicker centrals with tips faintly tanned, and what could be lovelier than those pale purple blooms rising from amongst them? A short, wide, pale green tube holds the flower with its pale green back petals and light purple inner ones with a deeper purple mid rib: the base of these petals is the same green as the back ones. The bright purple filaments ending in orange anthers are pressed tightly against the style which holds aloft the many lobed pale pink stigma. The soft colourings of this flower and plant are superb. Another one with a purple flower is *C. macromeris,* meaning "with long or large divisions". Isn't it an unusual looking plant? Just a large cluster of long tubercles, with longish fine straw coloured spines. The flower is most attrac-

FIG. 68. *Coryphantha andreae* (upper left). *C. cornifera* (upper right). *C. radiosa* (center left). *C. neomexicana* (center). *C. macromeris* (center right). *C. asterias* (lower left). *C. radians* (lower right).

tive; the outer petals being fawn, the inner ones rose pink, both with a maroon mid rib. The edges of the petals are very feathered. As this plant is a cluster, many flowers are in bloom at the same time, making a most attractive picture.

Here is another with a yellow flower. This is *C. cornifera.* See the little black horn-like central spine? That is what "cornifera" means "horn bearing". This flower differs from the others in that where the deeper yellow stamens and the petals meet in the throat there is a ring of red, making this blossom quite distinctive. January is its flowering time, together with *C. radians* and *C. compacta.* The bloom of the former has long narrow, sharply pointed primrose coloured petals ending in a fine hair. There is a ring of deep pink at their base, this colour creeping up the back petals to form the mid rib. Bright yellow stamens gathered round the cream stigma lobes add the finishing touch to this charming flower. What could be more descriptive than the name given to *C. compacta?* It describes the plant perfectly as it is a very compact and neat plant. The tubercles are short and plump each ending in an oval areole filled with cream felt; the many cream spines arranged around it lie perfectly flat against the plant. The large yellow flowers have had great difficulty in pushing their way through the barrage of spines with the result that they are not quite perfect in shape, the spines are hiding them too tightly underneath. However they are lovely blooms, clear yellow with lightly feathered petal tips; the red throat stains the base of both the petals and the golden yellow stamens, so that the centre of the flower literally glows.

The round pink one like a ball is *C. radiosa* meaning "having spokes or radiating members". Its body is completely covered with spines which lie flat against it and there are so many to an areole they form a complete lath house over the plant and so shade it from the scorching rays of the sun. The spines are dusky pink, deepening at the tips and fading to straw at the base. This time last year it was enjoying life in the Mexican desert, I hope I will be able to keep it happy here. It flowered in the very early spring, evidently out of season, the change in the hemisphere has evidently upset its blossoming time for this year. The dusky pink buds had quite a struggle pushing through the lattice work, and when the flowers eventually opened they were not as large as some of the others, but very pretty for all that with their pinky bronze mid ribs and cream filaments shading to cream at the base and topped with bright yellow anthers. And the stigma lobes were bright cerise! The whole plant, flowers, buds, stigma lobes, spines and all were a lovely symphony in pink.

The tall plants in the group have failed to bloom so far which is surprising as *C. erecta* is 14 inches high and about 4 inches across. Maybe they take longer to reach maturity. There are several others here not mature enough to flower yet, the most interesting being *C. arizonica* with fine white spines completely hiding the body.

To find the natural habitat of the next group we would have to journey to Africa and travel from the Cape to the Mediterranean. Instead of going to all that trouble and expense we can see some of them here if we go down on our knees and look under the bench. Here they are, the large Stapelia family, including *Stapelia, Huernia, Caralluma, Echidnopsis* and *Piaranthus.* These all flower in the autumn so we have come at the right time. Yes, look at them! Flowers on almost all of them. I wouldn't try to smell them if I were you, the perfume of most of them is anything but sweet. In fact they smell like bad meat, and instead of attracting the lovelies of the insect world, bees, butterflies and moths, they attract blowflies. The flies are easily deceived and it is not an unusual sight to see maggots crawling about the flowers in a vain search for food, but they don't live long as there is absolutely nothing for them to eat. It doesn't look nearly as repulsive as it sounds. Look, there are some on *Stapelia hirsuta* now, but does it detract from the flower? I think not. It is such a lovely blossom, like a maroon-brown velvet star, with pale yellow irregular lines crossing the petals. All round the edges is a border of long, fine maroon and white hairs. Actually the whole flower is covered with short hairs which increase in length as they reach the centre. The petals are beautifully soft to the touch and when stroked feel just like my Ginger cat's ears. Hirsute means "pubescent with rather coarse, stiff hairs", but the hairs on this plant are neither coarse nor stiff, but soft and fine. Just South Africa is its habitat, no precise locality.

Further along is *S. comparabilis,* meaning "comparable", but it cannot compare with *S. hirsuta* for it is not nearly as beautiful, even though much larger. It is also a maroon-brown star, with self-coloured transverse lines, giving it a wrinkled appearance. A few fine dark maroon hairs adorn the edges of the long tapering petals. The flower has a raised centre, reminiscent of an air-cushion or a life belt. Its locality is unknown, so probably is a hybrid. Here is *S. variegata* var. *decora* with quite a different star-shaped flower. The petals are short and squat, triangular in shape. It is very decorative—lemon-yellow in colour, spotted all over with dark maroon blotches, which become smaller and thicker towards the centre of the flower. Why even the star in the centre, the stamens and stigma lobes are also spotted. What a pity the scent is so repulsive. *S. variegata* is somewhat similar, but biscuit-coloured fading a little towards the tips,

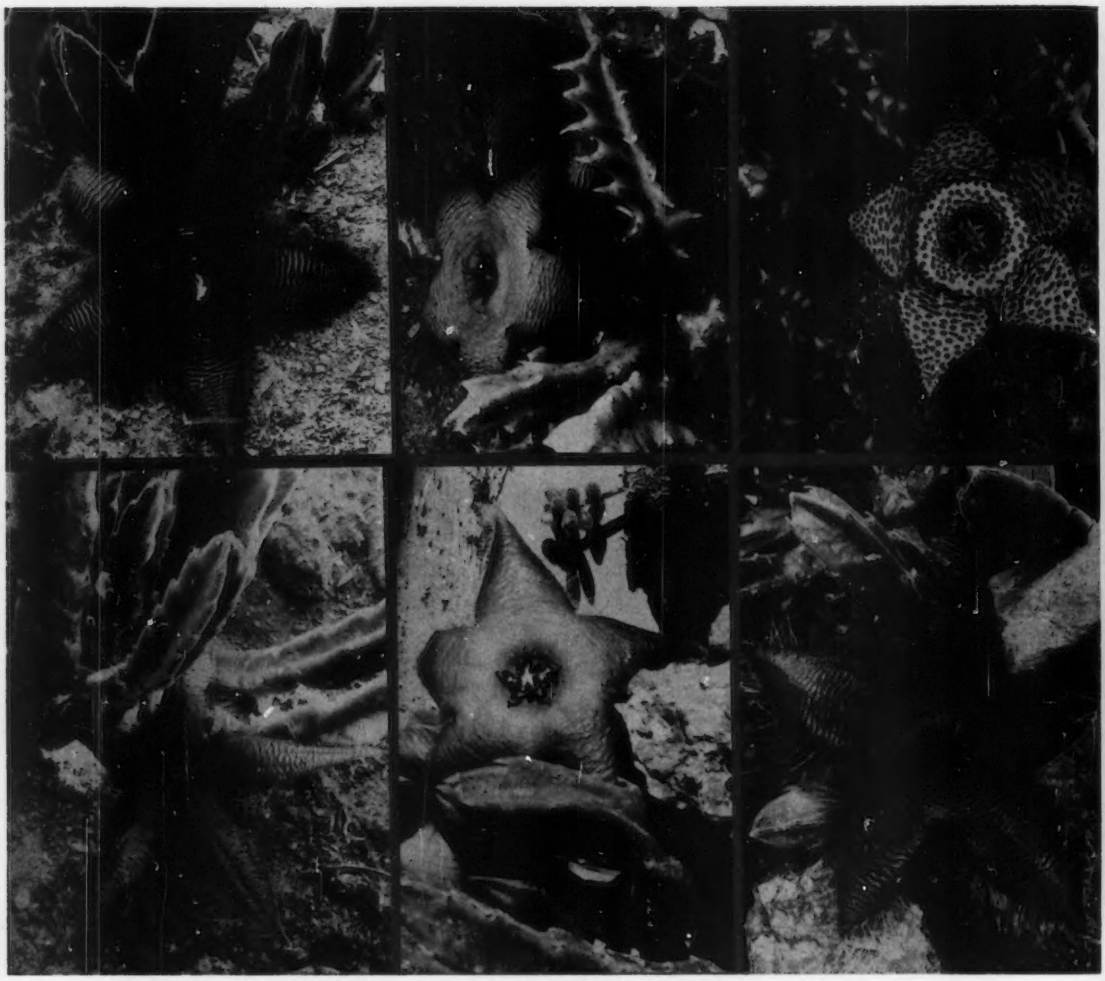


FIG. 69. *Stapelia hirsuta* (upper left). *S. comparabilis* (top center). *S. variegata* var. *decora* (upper right). *S. asterias* (lower left). *S. bella* (lower center). *S. grandiflora* (lower right).

the maroon spotting and blotching leaving a clear margin of the biscuit colour round the edges. The difference in the colouring of these two plants is most noticeable when seen side by side.

What a lovely flower on *S. asterias*. Its meaning, once again, "like a star", is truly descriptive, for it is like a large maroon star fish, with its long narrow, sharply pointed petals, covered with matching short hair. It looks and feels plush. Round the edges the hairs are longer, some having an almost irridescent look when seen against the sun. Each petal has three longitudinal lines or ribs and a few transverse markings, all in self-toning. It has, I think, the darkest colouring of any I have.

S. bella meaning "beautiful", is a mass of flowers and large balloon-like buds, and will be a picture for weeks. This plant is a hybrid raised in Europe. It is not as large nor as beautiful, in spite of its name, as some of the others, but its many flowers do add to its attractiveness. It is the one colour all over—maroon, lighter than the others, and has a tiny spot of bright yellow in the middle of the centre star. The petals appear to be hairless, except for a thin fringe round the edges. It also has a raised centre from which the petals fall backwards, like an umbrella viewed from above. Here is a very large one, *S. grandiflora* with a beautiful 6-inch bloom,

FIG. 70. *Huernia keniensis* (upper left). *H. schneideriana* (top center). *Caralluma europaea* (upper right). *C. burchardii* (lower left). *Echidnopsis cereiformis* (lower center). *Piaranthus globosa* (lower right).

maroon with faint transverse markings in yellow and softly covered with hair to match. The hair is longer round the edges with quite a lot of white intermingled, it looks as though it is surrounded by a halo. When *S. gigantea* flowers it will have an enormous bloom, twice the size of *S. grandiflora's*, but that is a treat in store. There are many young plants still to flower, so the bed will be full of anticipated interest for some time to come.

Now for some that are not Stapelias. These with the little bell-like flowers are Huernias. They all have five wide petals which form the bell, each petal coming to a sharp point with a smaller point between each. This is characteristic of *Huernia*. Lift up the little bell of *H. keniensis*, very dark purple inside isn't it, almost black?; the colouring on the outside is lighter with fine yellow veinings. This is the largest *Huernia* flower in my collection. *H. keniensis* is found growing on Mt. Kenya. Here is *H. schneideriana* from Nyasaland with a much smaller squat, wide-open bell, only about half the size of the previous one. The petals flare back showing the velvety black-brown centre. The five smaller points in between are only just there and no more. It has a most interesting stem covered with short teeth.

Here are two gems of the family, *Caralluma europaea* and *C. burchardii*. The former comes from the Island of Lampedusa an island in the Mediterranean Sea, hence the name *europaea*. The little brown flowers with yellow markings, look like clusters of dainty butterflies hovering

round the stems. *C. burchardii* comes from the Canary Islands; the stems remind me of the turrets in fairytale pictures, and the gorgeous little flowers could be the imprisoned princesses looking out of the windows. At first glance the blossoms appear white, but a closer look shows they are actually brown, densely clothed with short white hair, as though covered with hoar frost. There is just a glimmering of brown showing through the white, and the yellow centres add the finishing touch to these charming little flowers. Also to add to its attractiveness it has most surprisingly a sweet, tangy scent of hawthorn, or is it honey? I say surprisingly because it is usually taken for granted that all members of the Stapelia family, of which the Carallumas are a branch, have a most repulsive smell, and here is proof that it is not so. This plant would fill any room with a most delightful perfume. Have you ever noticed how the teeth along the edges of Carallumas tend to turn down, whereas in Stapelias they turn up? That is one way of identifying these plants. I wonder if, when *C. maroccana* flowers it will give me as much pleasure as the other two have. This is a branch of the family I would very much like to be able to add to.

Another member of this large Stapelia family is *Piaranthus globosus,* the first part of the name meaning "fat flower" and the second part, "like a globe". This funny little plant looks like a cluster of small green potatoes sitting on top of the soil; the small mustard coloured flowers are star shaped with a deeper yellow knobby centre. Still another little treasure is *Echidnopsis cereiformis.* It has been found in Eritrea, Somaliland and Ethiopia. *Echidnopsis* means "having the appearance of a viper" and *cereiformis* "like a Cereus". Some of the stems trail, others do stand up like a Cereus. In the photograph it looks just like a serpent raising its head to strike! It is a weird little plant, shooting out branches in all directions. The flower is so small, unless we were really looking for it we could easily pass it by. The outer petals are greeny brown, almost the same colour as the stem, but like some of the Huernias they are purplish brown on the inside, with a yellow centre. They seem to be placed haphazardly along the stem, popping out in all sorts of places and at all angles. The long green horns with which most of the plants are adorned, whether they be Stapelias or any other branch of the family, are the seed pods. When ripe they split down the centre and explode, scattering the seeds. With their thistle down parachute the seeds fly everywhere so one has to be quick if any are to be saved.

That is all this bed has to show us just now, and if our knees will hold us in an upright position again, we could continue with flowers that come from Africa. As it is Autumn; here on the bench above are the *Pleiospilos* with a wonderful show of flowers, but we will talk about these in the next chapter.

MAMMILLARIA COLLINSII

T. MacDougall

This fine species is common, and widespread, over the southern end of the Isthmus of Tehuantepec, Mexico. It also extends into adjacent areas and is found from sea level to perhaps 5000 feet altitude. In earlier years, when I could come upon colonies of *M. collinsii,* I was sometimes inclined to see "new" species. With passing years my impression has come to be rather that of unity within the species—the extremes in deviation from the "type" connected to it by a gradation of intermediates.

Thus, when in Dec. 1956, we discovered the shining plants of Fig. 73 they were accepted as old friends in new feathers. Paul Bates was with us, as "guest explorer", at the time, so I like to identify these plants as "Paul's Mammillaria".

FIG. 71. (1939-40). Long spined plants on limestone rocks at the ruins of Guiengola, Tehuantepec, Oax., altitude 1350 feet.

FIG. 72. (1940-41). Colony on the hot, near sea level, plains of Jalapa del Marques, Oax.

FIG. 73. (1956-57). Plants with glistening white wool and spines growing on a ridge separating Chontal and Mije territory, Oax., altitude 3000 feet.

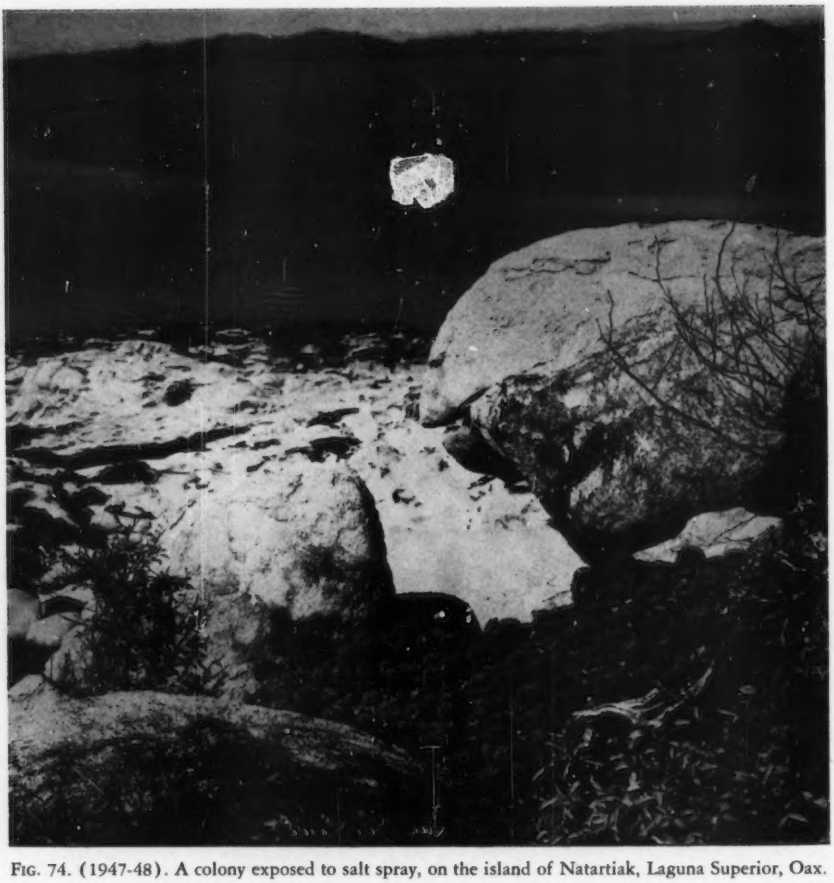


FIG. 74. (1947-48). A colony exposed to salt spray, on the island of Natartiak, Laguna Superior, Oax.

QUESTIONS and ANSWERS

Conducted by
HARRY JOHNSON
Paramount, Calif.

Question: What cactus would you recommend to plant in Apple Valley and Mojave Desert areas (California) that will grow with little water and can be used as a border fencing? Something that will reach 5 or 6 feet in height. Or possibly some cactus that will grow fast and reach 2 to 3 feet in height.

NORMAN BARNEY, *Glendale, Cal.*

Answer: The limiting factor in this area is the winter cold. Temperatures may drop to 5 to 10 degrees above zero which rules out most of the Mexican and South American cacti. My suggestion would be to plant the native cacti of the region which are equipped to withstand the heat, drought, and rabbits. *Opuntia chlorotica* may reach 5 feet or more. *O. bigelovii,* the Cholla or Jumping Cactus, may get much taller. Several of the arborescent Opuntias, as *O. acanthocarpa* and *O. echinocarpa,* may reach 3 to 5 feet. Some forms of those have beautiful silvery white spines. *Opuntia ficus-indica* I have seen survive 10 degrees above zero without too much damage. Probably it would stand lower temperatures if conditions were suitable. However, none of these cacti could be called fast growers under the conditions you suggest. We might add that Apple Valley is about 2000 feet above sea level and the summer heat may reach 110 degrees while the winters may bring occasional snow storms and frost.

A BRIEF REVIEW OF THE GENUS HAWORTHIA

A talk given before the Los Angeles Cactus and Succulent Society, March, 1957

By J. R. BROWN

Haworthias are now a large genus of usually very dwarf leaf succulents which are only found in South Africa and belong to the Lily family. The closely related genera of Aloes, Gasterias, and Apicras also belong to this family and as is well known the above four genera were in the early days all described under the name Aloe and it was naturally a slow process of gradual segregation into the separate genera under which they are now known.

A few Haworthias were known as long ago as about the year 1700, these included *Haworthia albicans, H. retusa, H. margaritifera, H. recurva, H. arachnoidea,* and *H. atrovirens* and were sent back to Holland during the time of the Dutch occupation of the Cape, as great interest was being aroused in the wonderful plant life of South Africa and naturally the remarkable and entirely strange succulent plants were included.

However it was about 100 years later, about 1790-1830, that a very great interest was shown in South African succulent plants and during this period the names of Haworth, Duval, Salm-Dyck, Willdenow, Miller, de Candolle and others are very prominent in connection with succulent plants.

In the year 1809, Henri Auguste Duval, a French doctor in Alencon, Normandy, published a small unassuming catalog of the plants which he grew in his garden, under the title, *Plantae succulentae in Horto Alenconio,* and in this little catalog published the description of the genus *Haworthia,* naming it in honour of Adrian Hardy Haworth, the great English botanist. Duval probably had about 6 species of Haworthias in his collection at the time, namely, *Haworthia*

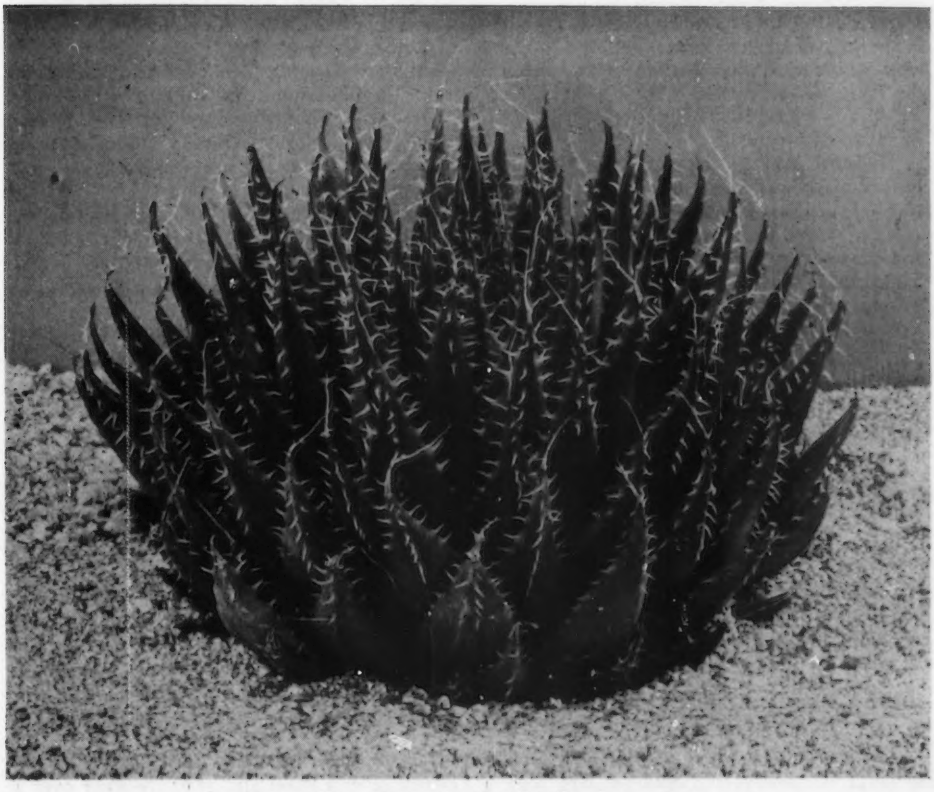


FIG. 75. *Haworthia arachnoidea* (L.) Duval nat. size

margaritifera, H. arachnoidea, H. atrovirens, H. cymbiformis, H. retusa, and *H. viscosa.* Incidentally, this catalog by Duval is one of the rarest publications regarding succulent plants, only one copy, that in the British Museum, is known to exist.

In 1812 Haworth enumerated 24 species in his *Synopsis Plantarum Succulentarum* and subsequently more than doubled this number in his *Supplementum* 1819, and his *Revisiones* in 1821.

The most outstanding work on Haworthias about this time was Prince Salm-Dyck's Monograph, *(Monographia Generum Aloes et Mesembryanthemi)* a superbly illustrated work of 7 parts or fascicles, the first of which was published in 1836 and the last part in 1863 shortly after Salm-Dyck's death. Salm-Dyck did not use the generic names *Haworthia, Apicra,* and *Gasteria,* but included all under the name *Aloe,* 56 illustrations of Haworthias are shown, 39 of which are now recognized as species, while 17 are recognized as varieties. The works of Haworth and of Salm-Dyck are what might be call[illegible] the fundamental works of Haworthia botany.

Little increase in the number of species was made by Baker, whose monograph, entitled, *A Synopsis of Aloineae and Yuccoideae,* appeared in the Journal of the Linnean Society 1800, and who subsequently described the Haworthias in the *Flora Capensis* 1896, vol. VI, as, while he added a few new plants, he disregarded several of Haworth's plants.

The next work of importance in Haworthia history is Alwin Berger's monograph, *Liliaceae-Asphodeloideae-Aloineae* in Engler's *Das Pflanzenreich,* 1908. Berger rearranged them into the sections under which we now mostly know them and described some 60 species and some 35 varieties of these species, but seemed to have no access to fresh material from South Africa and so during all this time little advance was made in the addition of new species. In recent years however an amazing number of new forms have been and are being discovered and at the present time the described species and forms of species are approximately 370, about 160 of this number given specific rank.

The most noted worker of recent times was Dr. Karl von Poellnitz of Germany whose descriptions of Haworthias were mostly published in Fedde's *Repertorium Specierum Novarum* but also in the Journals of various Cactus and Succulent societies and who at the time of his death in 1945 was working on a monograph of the genus. Another recent student of the genus was G. G. Smith of South Africa who published his results in the Journal of South African Botany. Dr. Flavio Resende of Lisbon also contributed to the knowledge of the genus, especially the cytological aspects. A. J. A. Uitewaal of Amsterdam is the greatest European student of Haworthias and has contributed especially by his researches into the nomenclature of the plants. His publications have appeared in *Succulenta* and other Journals. Wm. T. Stearn of the Lindley Library should be mentioned for his scholarly work in publishing *An Annotated Index to Salm-Dyck's Monograph* and also for the facsimile reproduction of Duval's Catalog, both of which appeared in The Cactus Journal of Great Britain.

Haworthias are divided into sections showing somewhat similar plant and leaf characters as follows:

Trifariae Haw.	*H. viscosa*	*Retusae* Haw.	*H. retusa*
Tortuosae Bak.	*H. tortuosa*	*Obtusatae* Berger	*H. cymbiformis*
Rigidae Haw.	*H. rigida*	*Planifoliae* Berger	*H. planifolia*
Coarctatae Berger	*H. coarctata*	*Muticae* Berger	*H. reticulata*
Margaritiferae Haw.	*H. margaritifera*	*Subregulares* Berger	*H. subregularis*
Albicantes Salm.	*H. marginata*	*Denticulatae* Bak.	*H. denticulata*
Scabrae Berger	*H. scabra*	*Limpidae* Berger	*H. obtusa* var. *pilifera*
Limifoliae G. G. Smith	*H. limifolia*	*Loratae* Salm.	*H. angustifolia*
Tessellatae (Salm.) Bak.	*H. tessellata*	*Arachnoideae* Haw.	*H. arachnoidea*
		Fenestratae Poelln.	*H. truncata*
		Fusiformes (Barker) Poelln.	*H. blackburniae*

One or two changes from Berger's arrangement were made by von Poellnitz, namely, the sect. *Tessellatae* (Salm.) Bak. instead of the sect. *Venosae* Berger, the sect. *Denticulatae* instead of the sect. *Laetevirentes* Berger, the sect. *Arachnoideae* Haw. instead of the two sects. *Setatae* Berger and *Araneae* Berger. The sect. *Limifoliae* was set up by G. G. Smith to include *H. limifolia* and its forms.

The sect. *Subregulares* with its lone representative *H. subregularis* does not now seem a very valid one, as we now have several Haworthias in the sect. *Muticae* showing similar characters. *Haworthia tuberculata* and its forms also seem out of place in the sect. *Margaritiferae* and another sect. could probably be erected for this species.

It will be noted that the sects. have been placed in two columns and for this reason; from time to time efforts have been made to break down the Haworthias into definitive groups based on floral characters. This has been mentioned several times and after checking over a mass of floral data which I had accumulated it

was found that the sects. were about equally divided, in that the first group of sects. have flowers with a more or less triangularly rounded cross section towards the base of the perianth tube while the second group shows a more or less hexagonally rounded cross section. Uitewaal proposed the names *Triangulares* and *Hexangulares* for the groups. Any significance of this will not be explored at the present time. It would seem to be very difficult to separate most of the species by floral characters, although many of the sections show very similar and somewhat distinctive floral characters.

Some mention should be made of the differences of the sections and some of the plants which belong in each:

Sect. 1. *Trifariae*	Plants with the leaves in three well defined, closely crowded rows on more or less elongated stems, *H. viscosa, H. asperiuscula, H. nigra.*
Sect. 2. *Tortuosae*	Plants with the leaves in somewhat looser, more spiralled 3-rowed arrangement on the elongated stems, *H. tortuosa, H. tauteae.*
Sect. 3. *Rigidae*	Plants with the somewhat spreading leaves in five very spiral rows on the more or less elongated stems, *H. rigida, H. hybrida.*
Sect. 4. *Coarctatae*	Plants with the more or less erect leaves closely crowded and overlapping and multifariously arranged on the elongated stems, giving the leafy stems a cylindrical appearance, *H. coarctata, H. reinwardtii, H. glauca.*
Sect. 5. *Margaritiferae*	This section contains the most conspicuously tubercled Haworthias; *margaritifera* meaning pearl-bearing, refers to this character. This sect. includes many widely differing plants ranging from *H. margaritifera* to *H. tuberculata.* Some have the tubercles united in cross bands, *H. fasciata.* Most are stemless or apparently so, a few are stemmed in age, as in *H. papillosa,* and several probably have the largest individual rosettes to be found in the genus.
Sect. 6. *Albicantes*	Characterized by the smooth, whitish cartilaginous leaves, *H. marginata,* long known as *H. albicans.*
Sect. 7. *Scabrae*	Plants of this section generally have comparatively few leaves, more or less erect, sometimes falcate and more or less coriaceous, *H. scabra, H. sordida, H. starkiana.*
Sect. 8. *Limifoliae*	Plants stoloniferous and forming rosettes of erect-spreading leaves, with transverse file-like ridges or with solitary tubercles arranged in more or less transverse rows, *H. limifolia.*
Sect. 9. *Tessellatae*	Plants with a very characteristic leaf face, in most the veining of the leaf face is united, giving a tessellated or checkered effect as in *H. tessellata.*
Sect. 10. *Retusae*	The upper part of the front of the leaf formed into a more or less retuse face. Some of the most interesting windowed Haworthias belong here, such as *H. retusa, H. mirabilis, H. picta, H. paradoxa.*
Sect. 11. *Obtusatae*	Rosettes of leaves usually very compact, leaves more or less erect, smooth, green, apex usually obtuse, usually more or less thickened at or near apex. *H. cymbiformis.*
Sect. 12. *Planifoliae*	Rosettes of leaves usually looser, leaves smooth, green, flatter, more acute and usually broader than those of sect. *Obtusatae. H. planifolia.*
Sect. 15. *Denticulatae*	Leaves smooth, green, usually narrower in proportion to their length, acute, usually with small teeth on margins and usually with more pronounced pellucid areas in upper part of leaf. *H. mucronata* var. *denticulata.* The above 3 sections are difficult to differentiate, as while there are distinct and extreme forms there are forms which merge into each section. The flowers are also quite similar and looking at a large group of forms of each section in flower, and growing side by side, little difference in floral characters can be noted.
Sect. 13. *Muticae*	Plants usually characterized by the soft, swollen, pale green leaves showing a reticulating network of lines, especially in the upper part of the leaves, the lines often obscure but becoming more prominent when the plant is dormant and where strong light prevails. *H. reticulata.*
Sect. 14. *Subregulares*	A doubtful section. *H. subregularis* is the sole member.
Sect. 16. *Limpidae*	Plants with an abrupt line of separation between the chlorophyll bearing part of the leaf and the pellucid tip. Here again we have some of the interesting windowed Haworthias, e.g. *H. obtusa* var. *pilifera.*
Sect. 17. *Loratae*	Plants with more or less erect, often recurving, firm and somewhat coriaceous, opaque leaves, usually with small teeth on the margins. *H. angustifolia.*
Sect. 18. *Arachnoideae*	Formerly 2 sections, *Setatae* and *Araneae,* however recent discoveries have brought to light Haworthias which show a gradual merging of the 2 sections and it is now difficult to separate them. We have in this section the most pronouncedly toothed plants, varying from the shorter, setiform-toothed *H. setata* to the ciliate-toothed *H. bolusii.* The type plant of the genus, *H. arachnoidea* (L.) Duval belongs here.
Sect. 19. *Fenestratae*	Plants at once distinct by the truncate, windowed leaf tips. *H. truncata, H. maughanii.*
Sect. 20. *Fusiformes*	Plants with fusiform roots, and somewhat grass-like leaves *H. blackburniae, H. graminifolia.*

FIG. 76. *Haworthia caespitosa* Poelln. nat size

Having considered the sections into which the Haworthias are separated some of the plants can now be mentioned: *Haw. viscosa* and its numerous forms are very distinct with the so closely crowded and overlapping leaves in many cases forming prism-like leafy stems, some of the most slender leafy-stemmed forms of Haworthia occur here, some forms having leafy stems only 15 mm. in diameter. *H. asperiuscula* and *H. nigra* are also interesting plants of the sect. *Trifariae.*

H. tortuosa has several forms and there are also many hybrids often confused with it. Haworthias of the sect. *Rigidae* are probably not too well known, *H. rigida, H. hybrida,* and *H. lisbonensis* belong here.

H. coarctata is very well known, easily grown and seems to stand a lot of abuse and still have a good appearance. *H. reinwardtii* with over 20 vars., all of them very attractive and neat. *H. glauca, H. herrei,* and *H. jonesiae* are glaucous leaved forms. *H.. greenii* is another well known Haworthia of this sect. *Coarctatae.*

H. margaritifera is a very well known name but frequently abused, nearly any plant which in the least resembles *H. margaritifera* and has white tubercles may be found under this name. *H. margaritifera* may attain a very large size and is probably, when one considers a single rosette and not an aggregation of leafy stems as in some other Haworthias, one of the largest in the genus. A variety of *H. margaritifera* known as var. *granata* but more correctly var. *minima* is well known, and is a very handsome and ornamental plant.. The plant well known under the name *H. fasciata* var. *caespitosa* but now considered a var. of *H. attenuata* is a good example of those Haworthias having the tubercles united into transverse bands. This particular plant has the most distinct and whitest bands of all and can be grown into a very charming specimen. Other Haworthias of this sect. include *H. attenuata, H. subattenuata, H. radula, H. papillosa,* etc.

H. albicans, now more correctly *H. marginata,* is a very striking plant having stiff, grey-green, smooth leaves with white margins and keels in the upper part of the leaves.

Haworthias of the sect. *Scabrae* are probably not too well known at the present time but some of them are very distinctive and interesting, here we have *H. scabra, H. starkiana, H. sordida, H. longiana,* etc. *H. starkiana* is probably the finest.

H. tessellata is very well known and is always

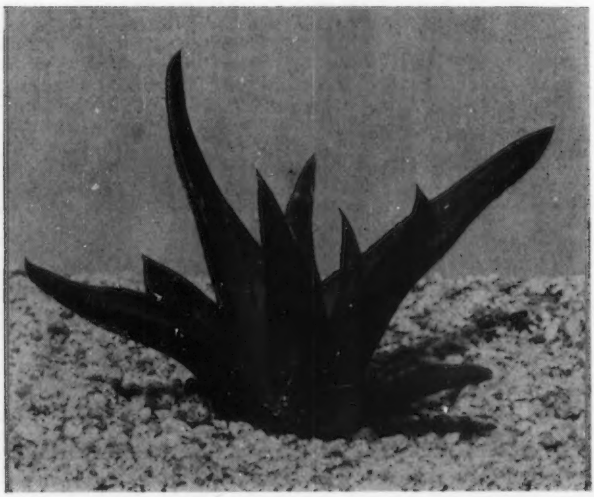


FIG. 77. *Haworthia scabra* Haw. nat. size

fascinating with the glassy-like leaf faces showing a pattern of checkered veins, its probably more attractive form, var. *parva* is also widely known. *H. venosa* which has very obscure checkered venation also belongs here.

The sect. *Retusae* includes a great number of very interesting plants. Haworthias which in a state of nature grow comparatively deeply in the soil with only the retuse faces of the leaves exposed to the light. The faces are more or less windowed, in some cases very much so, the well known *H. retusa* being a good example. These so-called windows filter the strong sunlight during the hot dry season greatly reducing the intensity of the light reaching the stomata bearing lower part of the leaves, thus greatly reducing the drying out influence of the strong sunlight. This of course plays little part in the plant's life in cultivation, as these extreme measures of drought protection are not required and most of the retuse leaved forms respond to changed conditions under cultivation by bearing a great many more leaves and becoming quite prominent and attractive plants on top of the soil and are thus more appreciated and admired by the lover of plants, even though they may not be so interesting from the botanist's point of view. *H. retusa, H. turgida, H. mirabilis, H. pygmaea, H. paradoxa,* belong here.

H. cymbiformis of the sect. *Obtusatae* has many neat little forms such as *H. cymbiformis* var. *translucens,* var. *compacta,* var. *obesa,* etc. *H. incurvula, H. lepida,* and the branching *H. ramosa* also belong in this section.

H. planifolia which now has some 12 varieties and forms e.g. var. *setulifera,* var. *exulata,* and var. *incrassata. H. planifolia* forma *agavoides* is probably the most interesting Haworthia of this section *Planifoliae.*

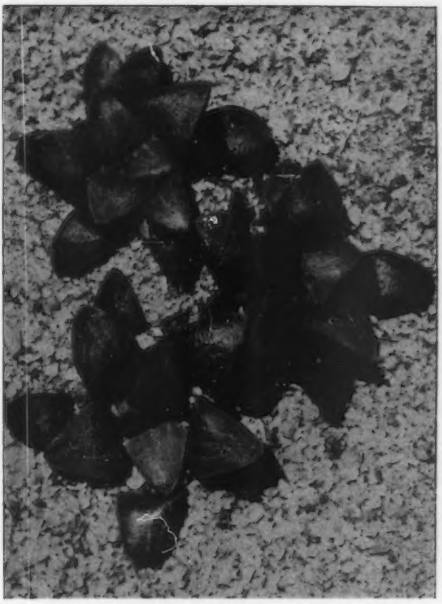


FIG. 78. *Haworthia pygmaea* Poelln. nat size

H. haageana is probably one of the best known of the plants of the section *Muticae.* There are many neat little Haworthias in this section, *H.*

FIG. 79. *Haworthia turgida* Haw. nat. size

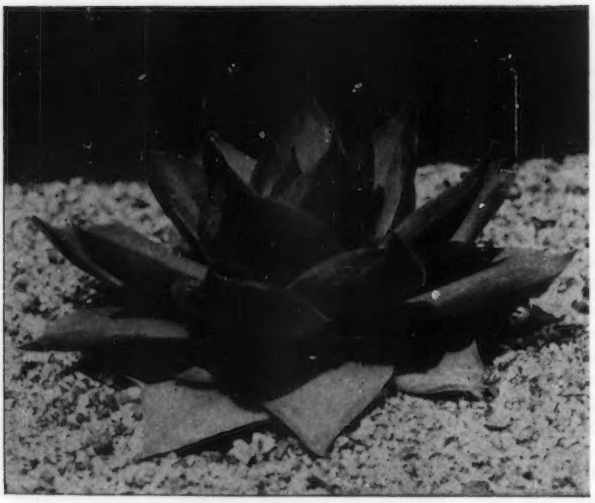


FIG. 80. *Haworthia planifolia* forma *agavoides* Poelln. nat. size

reticulata, H. hurlingii, H.. luteorosea, etc. The plants of this section usually have exceptionally large, more or less stellate flowers of a pink color.

Many name changes have been made in the sect. *Denticulatae,* the name *H. mucronata* having been found to have priority over *H. altilinea* so that now the names of plants well known in this sect. are *H. mucronata* var. *denticulata,* and *H. mucronata* var. *altilinea, there* are also numerous other forms or vars. of *H. mucronata. H. nortieri,* and *H. globosiflora* also belong here.

The sect. *Limpidae* also contains some of most striking windowed plants having the remarkable power of withdrawing into the soil during the hot dry season, this is accomplished by means of their retractile roots, leaving only the pellucid tips of the leaves visible at the surface of the soil. This sect. has also many name revisions so that some well known plants in this sect. are now named *H. obtusa* var. *pilifera, H. obtusa* var. *dielsiana,* or it may be put this way, *H. pilifera* and its vars. are now considered as vars. of *H. obtusa.* This Haworthia, *H. obtusa* was a little known plant named by Haworth recently brought to light and clarified by Uitewaal.

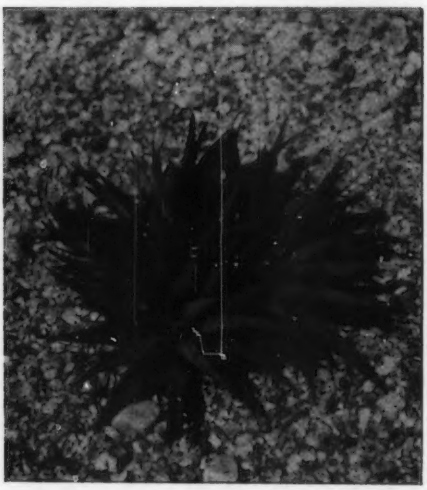


FIG. 81. *Haworthia angustifolia* var. *liliputana* Uitewaal nat. size

Some Haworthias of the sect. *Loratae* are fairly well known, these include *H. floribunda, H. variegata, H. angustifolia* var. *denticulifera* and *liliputana,* the latter is one of the smallest and neatest of Haworthias.

The Haworthias of the sect. *Arachnoideae* are the most bristly or as the name would imply, spidery-looking plants of the genus. *H. arachnoidea, H. setata, H. herbacea* which is well known under the old name of *H. atrovirens, H. bolusii,* and *H. translucens* are well known plants of this section.

The most amazing *H. truncata* and its close ally, *H. maughanii* always arouse great curiosity by their peculiar truncate leaf tips. They are also pronounced windowed plants, the truncate windowed leaf tips being the only visible part of the plants when growing in their natural environment.

The unusual *H. blackburniae* and *H. graminifolia* with large fusiform roots and grass-like leaves would seem to be the only Haworthias which might be regarded as root succulents.

It is also interesting to note the different means by which Haworthias protect themselves from weather conditions during the hot dry season. In

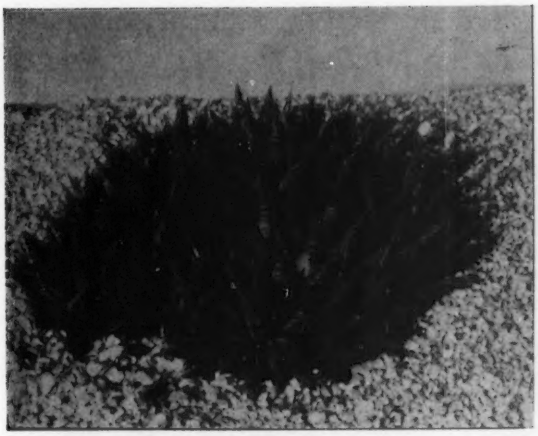


FIG. 82. *Haworthia herbacea* (Mill.) Stearn reduced

the case of many of the longer leaved forms, *H. radula, H. longiana, H. blackburniae,* etc. the leaf ends wither, thus decreasing the leaf area. Most of the tubercled forms such as we find in the sects. *Margaritiferae* & *Coarctatae* fold their leaves closely inwards and present the rough tubercled backs of the leaves to the sun. This also occurs in many of the smaller plants of the sect. *Retusae,* probably in those forms not having pronounced contractile roots. This folding inwards of the leaves is especially noticed in the forms of the sect. *Arachnoideae.* Other plants as *H. viscosa, H. asperiuscula,* etc. have tough, leathery leaves. The ability of others to withdraw themselves into the soil has already been mentioned.

The coastal fringes of the Little Karroo seem to have the greatest concentration of Haworthia species, where they occur usually below 2000 feet and extend to sea level, this concentration extending to the S. E. districts of the Cape Province to the neighborhood of King Williams Town. Most of the Haworthias are quite local in their distribution, but one or two seem to be quite widespread, at least in forms close to the species, e.g. *H. tessallata* var. *engleri* is found in S. W. Africa and a form of *H. venosa* named var. *oertendahlii* is also found there. *H. setata* or forms of it seems to be frequently observed in Little Namaqualand. The very distinct *H. limifolia* and its several forms occurs in Basutoland far to the north of other Haworthias and no doubt this little known area and areas north of it, e.g. Zululand, may yield other interesting Haworthias.

A few species of Haworthia have quite evidently been in cultivation in this country for a considerable period of time. In Blanc's catalog issued in Philadelphia around 1880, mention is made of having "20 varieties of Haworthia", the only one given a name is *Haworthia longiaristata,* however the description and cut clearly indicate this plant to have been *Aloe aristata.* Some of the Haworthias known to have been in cultivation in this country for a long time include *H. coarctata, H. cuspidata,* forms of *H. attenuata, H. subattenuata, H. hybrida,* and a form of *H. reinwardtii.*

It is in the wide and varying shapes and patterns of plant and leaf of these little succulents that their charm and interest lies, offering a wide range of intriguing forms. Being dwarf plants their space requirements are not excessive, and they adapt themselves exceptionally well to pot culture and are reasonably free from insect pests or disease, and requiring a modicum of shade to be at their best this allows Haworthias to be grown in a great many indoor locations and still retain a good appearance.

Many Haworthias are very prolific and form large clumps in age, others seemingly remain a simple plant throughout their existence, although it appears that some of them when brought into cultivation are proliferous, this is no doubt due to the more easy conditions of life under culture.

The root systems of Haworthias are generally quite superficial, and probably the plants of the sect. *Loratae* with very short fibrous roots are most easily injured when allowed to become too dry.

Judging from the numerous photographs available from all over this country, as well as from Europe, etc. Haworthias can be grown well nearly everywhere and seem to grow well in almost every type of fairly porous soil. A mixture of ⅓ good garden soil, (excluding all clay soils), ⅓ decayed leaf mold, and ⅓ very coarse, sharp sand seems to be a soil which suits them very well. Good drainage at the bottom of the pot is of course essential.

A NEW CACTUS FROM ARIZONA

BERNARD W. BENSON

Boyce Thompson Southwestern Arboretum, Superior, Arizona

Another rare plant from Northern Arizona is to be added to the complex of Echinocactanae previously reported. Mr. N. A. Paradine collected the first plants in House Rock Valley, Coconino County, Arizona, in the spring of 1956. These were found under the protection of small sagebrush plants. Later others were found in clumps of perennial bunch grasses.

The plants are striking for the long, white, hair-like spines completely covering the stem apex. The spine texture and arrangement differentiate this plant from any previously reported from Arizona.

Pediocactus (*?*) **paradinei** B. Benson, *sp. nov.* Stems simple, globose, 3-4 cm. high, 6-8 cm. in diameter, the entire plant including the spine mass up to 15 cm. in diameter; tap root up to 15 cm. long; tubercles strictly distinct, with no evidence of coalescence into ribs, apically obliquely truncate, bare in the axils, less than 0.5 cm. high; spines white with light brown tips, 5-7 cm. long, hair-like, flexible, erect; radial spines about 20; central spines 4-6, scarcely distinguishable from the radials; epidermis barely visible because of the numerous spines; flowers not borne on top of the plant, each at the top of a tubercle, adjacent to the spiniferous areole, ultimately leaving a fruit scar 3 mm. in diameter; outer perianth segments lanceolate, inner perianth segments with pink mid-stripes; anthers and filaments yellow; fruit dry at maturity, obovate, rounded at the base, truncate at the apex, 5 mm. long, 7 mm. in diameter, opening by an apical pore or dehiscent by a longitudinal fissure, basal pore none as far as known; seeds small, black, obliquely obovate, less than 2 mm. in diameter, covered with small tubercles; hilum large, ovate, keeled.

Simplex, globosus, 3-4 cm. longus, 6-8 cm. diametro, base turbinatus, mamilliferus; tuberculis laxis, oblique truncatis, axilla nudis; areolis ovatis seu ovato- lanceolatis; aculeis flexilibus albis. 5-7 cm. longis, aculeis exterioribus sub-20, aculeis interioribus 4-6; epiderme propter spinas tam numerosas vix manifesta; areola florifera sub tuberculi apice; bacca parva sicca, latere no base dehiscente; seminibus parvis obovatis obliquis minute tuberculatis, hilo magno ovato subbasilare.

Type collection: Holotype deposited in the Boyce Thompson Southwestern Arboretum Herbarium, No. Bwb 8-1956-1. Isotype deposited in the Herbarium of Pomona College, No. 286,120.

The most obvious features of this plant distinguishing it from its relatives are in the characters of the spines. Spines of related groups are as follows, as described by Kearney and Peebles in "Arizona Flora":

Toumeya: "central spines strongly flattened and grooved, flexible, twisted and curved, papery."

Utahia: "central spines not flattened or papery or flexible . . . spines horny."

Navajoa: "spines spongy, except for a small hard core." [Otherwise as in *Utahia.*]

The spines of the new plant are not strongly flattened and grooved and papery like those of *Toumeya:* horny like those of *Utahia;* or spongy with a hard core like those of *Navajoa.* They are not short, acicular spines like those of *Pediocactus simpsonii.*

FIG. 83. *Pediocactus paradinei.* Mature dry fruits, the nearest one showing the longitudinal dehiscence.

The seeds most closely resemble those of *Pediocactus simpsonii.* The following table compares them with the seeds of related groups:

GENUS	RELATIVE SIZE	SURFACE	SHAPE
Neobesseya	Similar	Pitted	Different
Toumeya	X 2	Tesselate	More globose; keel none
Coloradoa	X 3	Tesselate	Slightly keeled
Sclerocactus	X 3	Tuberculate	Similar; keel none
Utahia	X 4	Tuberculate	Hooked at the hilum; keel none
Pediocactus	X 2	Tuberculate	Similar; keel present

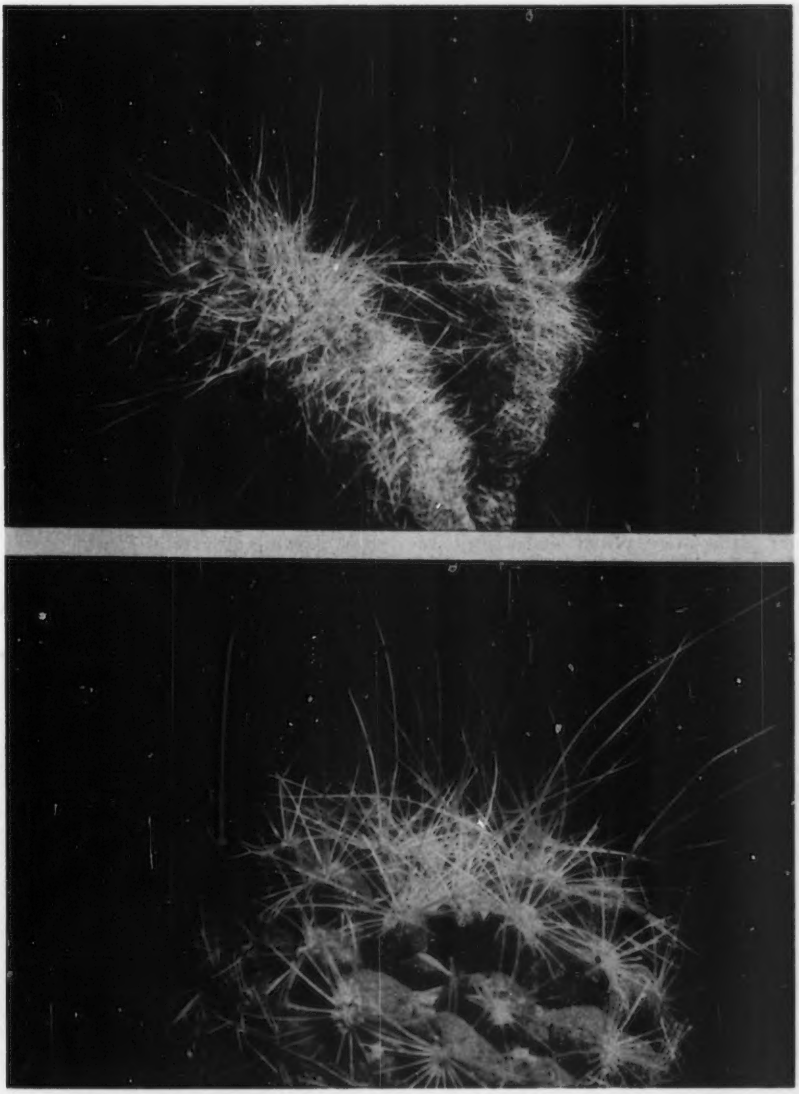


FIG. 84. *Pediocactus paradinei*. Above, two individual plants with elongated stems. Below, close-up view of the apex of a single stem, showing the tubercles and the long, white, flexible spines.

In August of 1956, a description of this plant was sent to the editor of the Cactus and Succulent Journal for publication. In October of 1956, Mr. W. T. Marshall of the Desert Botanical Garden, Tempe, Arizona, described the same plant in the *Saguaroland Bulletin* 10: 89-91. The author appreciates Mr. Marshall's courtesy in stepping aside to permit the naming of *Pediocactus paradinei*. We appreciate the aid and cooperation given us by Dr. Lyman Benson in the preparation of the description and of Dr. Philip A. Munz in checking the Latin diagnosis.

THE NEW YORK CACTUS SOCIETY EXHIBIT

Last March the New York Cactus Society was going its way peacefully with never a thought beyond the program of the next meeting, when suddenly a bombshell landed in its midst in the form of an invitation to exhibit in the New York Flower Show. With just a few scant weeks to prepare for our first show and without the experience of previous shows behind us, our peaceful existence was turned into turmoil. The theme of the entire flower show was, "Gardens of Old New York", and it was felt that our best course would be to show how our members created cactus gardens in their own windows. Our booth was tucked away in the furthermost corner of New York's gigantic new Coliseum but being in the corner had the advantage of having two walls behind us. One wall was decorated with maps of the Old and New Worlds, while on the display table below specimen plants were placed under their respective maps, which were created by our versatile violinist, Louis Simon. The remaining wall became the brain-child of our man of all work, Dr. Jerry Barad, who photographed many of the members' window gardens with their varied shelf arrangements and window boxes as well as greenhouses. These photos he enlarged to near mural size, which when mounted on the wall created an enormous amount of interest. On the table directly below were planters and dish gardens and samples of shelf arrangements to show how best to make use of the limited space of our New York windows. All in all it was a most attractive exhibit and drew attention far beyond our wildest expectations. On opening day we were swamped with crowds who came to see and ask questions, and crowds continued for the balance of the week. Oh yes, we mustn't forget to mention that we won third prize for the informational exhibits. The judges scolded us for certain omissions which cost us second prize, but with the experience gained in our first show we will not be satisfied with anything less than first prize next year.

We found there is a great deal of interest in growing cacti and succulents in New York with

FIG. 85. New York Cactus and Succulent Society exhibit

most people not knowing where to buy decent plants or information on how to grow them. We think we did a first rate job of promotion for Messrs. Johnson and Gates and also the Abbey Garden Press! We had hundreds of requests for catalogues and books and we had to mimeograph a list of them. We secured names of about 100 people who showed an active interest and then called an open meeting on May 19th at the New York Botanical Garden from which we are in hopes of acquiring many new members.

None of the members who staffed the exhibit booth will ever forget the Christmas Cactus, a beautiful plant in full bloom, brought in by our expert grower, Walter Mansell. People who obviously had no interest in any other succulent plant in the world would come scurrying over as soon as they caught sight of that flaming beauty. They either had one themselves or their grandmothers did and why didn't their's flower? It is amazing how few of them had ever heard of a resting period! When the traffic got too heavy and our voices too hoarse, that old Zygocactus would disappear under a table until relief came.

The youngsters who came to our booth were in the special province of Dr. Abe Bernhardt, who has done a great deal of work with youth groups. He has started many a youngster on the road to a happy life with plants—succulent plants, of course. No account of the show would be complete without mention of E. J. Alexander, who secured the invitation to exhibit for us and who was of invaluable assistance in arranging our plant displays. Neither do we want to forget Walter Kluth and Orville Steward — the former for solving our transportation problems with his station wagon, and the latter for becoming our property man who supplied all our basic requirements and most of the frills as well. And for the ladies who manned the booth during the daylight hours and then rushed home to take care of their families—our humble thanks.

Joseph Emma, Sec'y
274 First Ave.
New York, N. Y.

FROM OREGON

I have been using well rotted cow manure and Johnsons Vit. B-1, in watering, and my plants are "busting" their buttons putting out buds. My *Ferocactus pilosus* has 7 buds and am I tickled! However we put the pot outdoors and leave it all summer, which I think accounts for the show of buds. Also have a *large* opuntia we put out and we may get blooms on that. However the things in the greenhouse look splendid. I am also anxious to meet Mr. Johnson. His offerings are most unusual. He sent a *Toumeya papyracantha* to a friend of mine and it was full of buds. Sent me a wonderful *Haworthia truncata. So much for the money.*

MILDRED WELLBAUM

NEW MEXICO CACTUS and SUCCULENT SOCIETY

First six months of 1957

The January meeting of the New Mexico Cactus and Succulent Society was held at the home of Mr. and Mrs. Prince Pierce on 18 January 1957. The committee appointed to investigate the possibility of planting cacti at the Civic Auditorium reported they would function soon. An additional committee of two was appointed to locate a qualified judge for a competitive cactus show to be held at the 1957 State Fair. The President, Mrs. Ann Sherman read a letter from the Albuquerque Garden Club inviting the Society to participate in the Spring Flower Show. The invitation was accepted.

The February meeting was held at the home of Mr. and Mrs. Luke Vortman. A committee of three was appointed to plan field trips for the Society. Also a general discussion was held on the raising of "Contented Cacti". Discussed were ideas and experiences in pest control, potting mixtures and care of cacti.

The March meeting was held in the Botany Building of the University of New Mexico on 15 March 1957. The Chairman of the Auditorium Landscaping Committee reported that the City Park Commission was pleased to allow the Society space at the Auditorium to be planted in native cactus. A bed approximately 30 feet wide and 450 feet long was suggested. After the business end of the meeting was over, Dr. R. C. Jackson, of the University Faculty, spoke on the subject "Taxonomy".

The April meeting was held at the home of Mr. and Mrs. Charles Harrington on 28 April 1957. The Landscaping Committee reported they had accepted the bed as offered by the City Park Commission. The commissioner indicated the bed would be plowed, the soil prepared and enclosed in flagstones in about two weeks. Two more members were added to the Planning Committee. The Field Trip Committee suggested a field trip to either Las Cruces or Espanola. The committee appointed to locate a qualified judge for a competitive cactus show recommended the competition be among club members rather than the general public. The recommendation was accepted.

The May meeting was held 19 May 1957 at the home of Mr. and Mrs. Charles L. Furrer, Sr. The Planning Committee on planting of cacti at the Civic Auditorium presented a sketch to the members for approval indicating where various species of cactus were to be planted. The sketch was accepted as presented. It was decided to start planting on 8 June 1957. The President read a letter from Alpha Chi Omega inviting the Society to the Rose Rendezvous on 23 May.

On the morning 8 May, approximately 10 members planted the cacti on hand in the plot at the Civic Auditorium.

The June meeting was held on 16 June 1957 at the home of Mr. and Mrs. Chris Steinman. At this meeting it was decided that members go individually to the Auditorium to plant cactus gathered since the first official planting. Prearranged planting sketch is to be followed as nearly as possible. At this meeting Mrs. Anna K. Sherman, Mr. Ed Nadolny, Mrs. Jeanne Nadolny and Mrs. Dennis Cowper were elected delegates to the Biennial Convention.

CHARLES L. FURRER, SR.
8026 San Juan Road NE.,
Albuquerque, New Mexico

NEW CACTUS CLUB

A cactus club is being organized by Mrs. Ruth Stanton of 4835 Compton Blvd. in the Lawndale area. They will probably meet on Friday evenings in the Lawndale Community Center, 174th and Burin Sts. Mrs. Stanton's phone is Osborne 6-6218.

THE PRESIDENT'S MESSAGE

New Affilliates

The Cactus and Succulent Society of America takes pleasure in welcoming the following Societies into our growing list of affiliates.

The Justus Cactus and Succulent Society of Grover City, California (Mrs. Mary Walker, Reporter, Box 648, Grover City, California).

The Friendly Cactus and Succulent Society of Indianapolis, Indiana (Mrs. Elnora Haines, Secretary, 705 East Epler Avenue, Indianapolis 27, Indiana).

The New York Cactus and Succulent Society (Mrs. Gerald S. Barad, 218 Beaumont Street, Brooklyn 35, New York).

Natal Cacti and Succulent Club, 1010 Sanlam Building, Smith Street, Durban, South Africa.

It is a pleasure to have these new organizations within the Society, and we look forward to a pleasant association with them.

The Society as a whole is growing, and the total membership has increased from about 1250 at the beginning of 1956 to about 1500 now. Approximately 300 members live in foreign countries.

The 1957 Convention at Berkeley, California

The excellent conventions of the past gave great impetus to the success of the 1957 convention in Berkeley, California, which set a new registration mark of 174, the previous record being 134. The outstanding sponsorship of the Cactus and Succulent Society of California, centering in the San Francisco Bay Region, is a model for conventions of the future. Mrs. Charles Genasci, President of the host society, and Mr. Paul Hutchison, Convention Chairman, and all who worked with them are to be congratulated upon their good work. Behind all that took place was evidence of the careful planning and hard work of Homer and Ethel Rush (as acknowledged elsewhere) and the advice of Howard Gates. The work of others on the Convention Committee and within both the Cactus and Succulent Society of California and the Cactus and Succulent Society of America can not be acknowledged individually because so many worked hard both before and during the Convention thaat no one individual may be singled out without injustice to the rest. In every respect this was a magnificent team effort—by an all-star organization. So many people contributed so much to the success of the Convention that the entire issue of the Journal could be filled with acknowledgments of individual help and ideas. The writer has attempted to acknowledge individual contributions by letter, but is haunted by the fear that someone may have been overlooked or that inconspicuous contributions, just as important as those seen more readily, may not have come to his attention.

It was a special pleasure to have present and to introduce Dr. T. H. Goodspeed, Director Emeritus of the Botanical Garden of the University of California, which has contributed much to the Society and to the Convention. The Convention group was particularly pleased to have present five former presidents: Edgar Baxter (1935); Howard Gates (1936-37); Carl Brassfield (1947-48); Dr. Robert T. Craig (1949-50); Harry Johnson, Jr. (1951-53). Royalty included Pat and Slim Moorten of Palm Springs, who were in charge of the fun session and the crowning of the new King and Queen and Dr. and Mrs. Gerald Barad of New York City, King and Queen of the Phoenix Convention in 1949. King of the Convention was Mr. Ferd Marchanton of Vancouver, British Columbia. The gracious Queen was Mrs. Margaret Radden of Chicago, Illinois, who has attended all seven conventions. Mrs. Annie R. Trimmer of Auckland, New Zealand, representing the New Zealand Cactus and Succulent Society, travelled the greatest distance, and she was awarded a prize of $25.00 by Howard Gates on behalf of the California Cactus Growers Association.

The City of Berkeley, Mayor Claude Hutchison, the Berkeley Chamber of Commerce, the Hotel Shattuck, and the weather man all are to be congratulated upon their coöperation with our cactus and succulent team of organizers of the Convention.

SEVENTH BI-ENNIAL CONVENTION

The host society, Cactus and Succulent Society of California, fulfilled every expectation and made the convention of last July one of the finest on record. The five days were packed with hospitality, good fellowship, education, and fun. Dr. Lyman Benson proved to be a master of every situation and when teamed up with Mrs. Anne Genasci's group, the Convention was bound to be a success. The attendance was the largest of any convention and more than half of whom were Society members.

The cactus gardens in the San Francisco Bay area were even better than their pre-convention publicity. We will be glad to print pictures of the various gardens if those who took pictures will mail them to the editor.

Among the many interesting lectures were:

Collecting Succulents in the Orient by Dr. Reid Moran.

Collecting Cacti in Mexico by Robert Flores.

Development and Form in Cacti by Dr. Norman Boke.

Some Factors Relating to Germination of Cactus Seed by Dr. E. B. Kurtz.

Succulent Portraits from Africa by Harry Hall (Read by Paul Hutchison).

Collecting Cacti in Western South America by Harry Johnson.

Succulents at the University of California Botanical Garden by Paul Hutchison.

Haworthias by Jay Dodson.

Travelogue by Pat Moorten and Dr. Barad.

Cactus Collecting on an Expedition to the Gulf of California by Dr. George Lindsay.

Two of the most enjoyed sessions were: Horticultural Symposium, presided over by Myron Kimnach and Favorite Kodachrome Slides shown by members.

The third national meeting of the International Organization for Succulent Plant Study met on the day following the convention and the following papers were presented:

Distribution of Cacti in North America by Dr. Lyman Benson.

Distribution and Taxonomy of the Genus *Ferocactus* by Dr. George Lindsay.

A Revision of the Genus *Borzicactus* by Myron Kimnach.

Arguments for the Recognition of Two Species of *Epithelantha* in the Big Bend of Texas by Dr. Norman Boke.

The Genera *Dudleya, Orostachys,* and *Meterostachys* by Dr. Reid Moran.

Some Aspects of the "cerrado" Flora of Goiaz, Brazil by Dr. E. Yale Dawson.

Some Factors Affecting the Germination of Saguaro Seed by Dr. E. B. Kurtz.

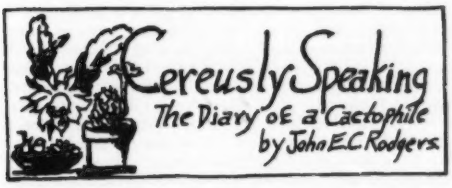
Structure and Development of the Shoot in Toumeya by Dr. Norman Boke.

The Phylogenetic Significance of Pollen in the Cactaceae by Dr. E. B. Kurtz.

S.E.H.

FIG. 86. The Moortens of Palm Springs, California in cactus attire

FIG. 87. The popular president of the host society, Mrs. Charles Genasci



Last spring was cold to hot as we here along Lake Erie's shores expect. The coldest last winter was 2° above zero and the hottest through May was 86°. Lake Erie is in the low 40's so those breezes the first two weeks of May are usually cold.

I intended to heat with a "fume burning gas stove" but I reconsidered and ordered my usual 1¼ tons of hard coal. I did burn it all up. Just ahead of the warm spell I used a 300 watt bulb with reflector for two nights and kept the temperature above 38°. I was worried I'll admit, but I've faith in my 24-year diary and it showed that the weather is never much below 35° after April 15. Natural gas is 13% higher than it was and with 35% more radiation from greenhouse than our seven-room house, I figured coal is best. January, February, and March were dry months; April was wet by an excess of 3.53 inches. The cool house I maintained last winter kept the colors fine on my succulents. The cacti began budding early last fall and have continued up to the present time.

My losses were less than usual (about one-tenth of 1%). I've mastered most of the "foreign-born plants" but my natives are a challenge. I'm more sure that a thorough inspection in the fall at storage time would help me a lot but I'm a "last minute man" and it never does seem that I get my plants in any earlier. Luckily I have duplicates of most of the ones that do go bad so I'm not out of specimen types from the S. West.

My under-glass culture has been extended to several other genera than Epiphyllanthus which I mentioned in my March-April column. I now have Rhipsalidopsis rosea, Gymnocalycium "frederickii", Huernia "brevirostris", Crassula teres, Rhipsalis clavata, Haworthia turgida and Piaranthus globosus. Most of these need special treatment such as freedom from cold draughts, more constant supply of moisture, more warmth through our glass house, etc. I used this method back in my beginning period but I had forgotten to use it while I used other methods. It works for short periods of time or until a plant can be trusted to grow in one's collection without coddling. They are a challenge.

A three-foot Euphorbia lactea developed dry rot below the soil level and about two inches above this level, since it had been a gift the year previous I decided to try to save it. I built a wall of soil up to the level of the firm tissue with a piece of tin bent in a circle about four inches more in diameter than the stalk. I kept this bone dry for two months. Brown projections appeared at and just below the soil level. I removed the soil from the pot, baked it, pruned back the dead tissue, set the plant back, tied it to two stakes, filled in the soil, firmed it and set the plant aside for a month. I then resumed light watering. Now the Euphorbia although six inches shorter, has all of its numerous branches and is in perfect health with new growth on all 17 branches. Now instead of 17 separate cuttings and several pieces of stem to root, I've the plant and not a promise of one in several years from the cuttings that I would have to coddle and fuss over.

The Bowiea volubilis is one of my most decorative plants. The four-inch bulb sent out a second growth stalk last December after the first had become dried up. After it reached four feet it sent out six petalled Star-of-Bethlehem-like flowers, green with white edges; I had never seen the flowers before and had supposed them to be minute. Instead, they are one-quarter inch

in diameter with a conic seed capsule in the center. What I had supposed to be flowers were the ends of the branches, semi-transluscent and resembling an asparagus form pattern.

My large Pereskia—grafted Schlumbergera gaertneri has another first for me, buds at the serrations of an older stem at least four joints back from the new end joints. On one side are two buds on the 5th and 7th serrations and on the other side at the 5th serration. It also has two buds at the end besides three stems which in turn have eight more stems and ten buds. I have often wondered if the Schlumbergera gaertneri would produce stems from the side serrations.

I was overjoyed when T. MacDougall's cutting No. 85, grown by me into a 30-stem plant, budded early in January 1957 and bloomed in March for the first time. It is a Pseudorhipsalis macrantha-like flower in shape and color with the odor of honeysuckle and Castile soap combined. The flower was about one and one-half inches long and the same across. One fruit set which is now the size of a cherry seed; it's a light green with small reddish purple scales. The flower is persistent. Mr. MacDougall thought it might prove to be a miniature Ephiphyllum or a Rhipsalis. The stems have a ruffled appearance which makes it very attractive. It grows rapidly with stems from the ends as well as sides of the older stems.

So far of the 14 MacDougall gifts and cuttings, I have flowered all but three. All grow well in a well rotted leaf mold and sand mixture with only the slightest trace of lime. Some are slow growers while others vine over a large area in a short time. Epiphyllum pumilum, Nos. 112 and 72 are prolific bloomers. Dr. Iwerson's old hybrid No. 117 and his three shades of the cross of E. ackermannii x Nopalxochia phyllanthoides are beautiful. I certainly hope that Mr. MacDougall will continue to enrich our collections with his living herbarium material. We understand that he has several new Echeverias that are ready for publication.

I am sure that my stored Echinopses would do better and bloom earlier if I gave them full sun and plenty of water all the year around. I have kept the newer discoveries and hybrids growing all winter now for three years and they bud and bloom earlier than my stored ones. The flowers last longer too, when it's cooler.

I have Rebutias, Lobivias, and Chamaecereus along with my Echinopsis and I find that the same treatment works for all of them. They got a heavy watering once a week with the excess water soaking into the cans of sand into which the pots are sunk. They all get the morning and part of the afternoon sunlight with plenty of ventilation.

I find that our hot, humid summers are severe on the epiphytes that come from the higher plateaus of Mexico. I keep mine in semishade and water them when there are no rains. I change the soil on most of them when I repot. I use well decomposed leaf mold and sharp sand. I find that they require good air circulation about the stems as well as the roots. Excess heat during budding season invariably means fewer flowers and more aborted buds.

Paging the Haworthia experts: Is there a possibility that flower color has been overlooked as one of the approaches to more beautiful Haworthias? In 1954 I tried my hand at cross fertilizing two of my less white flowers. The seedlings bloomed this year with fewer flowers on the shorter stalks but they have a distinct pink cast. I'm now trying to self pollinate the flowers to still further "set" the pink. Can anyone comment on this idea? I've found fragrance in Haworthias and now I think I shall look for color too. I can dream, can't I?

Next issue I will comment on the gardens visited during the wonderful convention at Berkeley.

JOHN E. C. RODGERS
1229 - 8 St., Lorain, Ohio

ROUND ROBIN NOTES

It is my pleasure to welcome the following members to our ever growing Robins: Mrs. Leon Moore, New Jersey; Mrs. Frank Hitchman, Oregon; Mrs. Rudolph Smidl, Chicago, Illinois; Mrs. Nathan Albert, New Jersey; Mrs. F. B. Hanson, Auckland, New Zealand; Mr. Glenn R. Webb, Arkadelphia, Arkansas; Mr. Jesse W. Dodd, Jr., Phoenix, Arizona; as well as Mrs. Fred Guertin, Rhode Island and Mrs. Billie Marie Anderson, Texas, who are each joining one more Robin.

Since my last report the Winter-Hardy Cactus R. Robin No. 2 has flown out with six members on its route. I hope one of its members will take over the directing of it for me. Please let me know.

Another new Robin, not yet ready at this time, but which will be soon, is the one for those interested in Mammillarias with the possibility that this Robin may also include other small cacti if members desire it. There is still space for additional members, so—won't you drop me a card if pincushion cacti are your delight.

In writing to me, if you are a new member wishing to join these Robins, would you mention, please, whether you are a member of our Cactus and Succulent Society. It would be most helpful to me.

Also the Director of C. & S. R. Robin No. 3 requests that I mention here that it would be much appreciated if members would answer this Robin within the five day limit and mail out to the next member without delay, as a quick round is always much more interesting. On the whole, I might add, Robin members have been most conscientious keeping Robins on the wing and, by an unwritten rule, when unable to write a letter, have put in a note to that effect. It is much better to do this than to let the Robin sit around and be forgotten. If any member has not heard from a Robin in a reasonable length of time, he or she should get in touch with the Director, and if new members, once I have placed them, don't hear from that particular Robin, write me and I'll see about it.

Among all the lively Robins with their fund of news I am beginning with the first report we have had of the Euphorbia Robin which, I find, is in its sixth year. Says its Director, Rose White of California, "I hope it survives another six years," as do we all. She goes on to say, "Good old Euphorbia bubalina! It seems to be able to come through all vicissitudes. I hope you enjoy yours as much as I always have mine. I even have a few of them growing out in the garden now and they stand up through winter rains, cold weather and all, and are still perky in the spring. I believe I have mentioned that E. bergeri does far better here if left outside all year round, which I now do, and have two nice big plants. I guess they just are not house plants. My experience with E. canariensis is that it is one of the slowest growing of any of the Euphorbias. I have a mature plant I bought from Johnson and it has only grown about two inches in the nine years I have had it." Many of the members have listed the Euphorbias they have and some members have nearly two dozen species. Maybe other members in the Robin have more but they did not say. Mrs. Maria Bernhardt in Chicago speaks of her E. ingens "which is almost six feet," and Mrs. Irma Huch has a huge E. lactea which is getting to be a problem because of its size. Euphorbias are a large genus of plants and once looking into the catalog and seeing their great variation and number it is quite easy to see why this Robin continues to be popular.

From Succulents Only Robin, Director Mrs. Midge Wihtol in New Jersey, there is a little more on Euphorbias mentioned by Rose White, who says, "E. grandicornis is one of the finest of the Euphorbias in my eyes, and very difficult to find to buy." She gives her method of propagating E. splendens and other Euphorbias which she says, "root better that way." "Let the cut dry

for a day or so, then tie the cutting to a stick and plant the stick so that the cutting is barely planted in the sand, for it will not root if covered deeply." From Alta Tarango's nice long letter from California there is so much of interest. All the way from "a breathtakingly beautiful" flower show to a trip to Mexico in which she said "they saw gillions of Cholla cactus and the giant Saguaros but never laid eyes on a succulent of any kind. We plan to go to Ensenada this spring again, and I will try to get some pictures of the white succulents hanging, or I should say, clinging from the sheer cliffs along the way." Edith Bestard from Arkansas comments to Midge Wihtol, "Your experience with many plants so closely parallels mine, for example, the loss of the supposed Aeonium pseudotabulaeforme and your comment thereupon, "May it rest in peace." How often I have thought that, with more bitterness than sorrow after I struggled with a stubborn something-or-other that just WON'T be happy with any kind of soil or treatment, and is determined to die."

From the Small Cacti and Mimicry Succulents Robin Roy Strange in England suggests after using brushes to pollinate flowers of the cross you wish to make, that "the pollen grains on the brush may be killed with pure alcohol or methylated spirits. After the brushes are dry they can be used again without danger of cross pollination." From Doreen Murphy in Scotland comes an interesting account of her problem of getting enough sun for her mimicry succulents and how she solved it. She bought a glass frame which comes in four foot units to which other sections can be added. "At present," she says, "her frame is 2'10" x 8' and heated by a three foot bar heater set 18" above the plants and thermostatically controlled. This way I get a temperature of approximately fifty degrees at the center, decreasing to about forty degrees at the ends. The plants, about two hundred, are placed according to the warmth they require. The heater keeps the glass dry and reduces the humidity to a minimum. The general results have been compact growth, good flowering and with the Lithops and Conophytums, markings that are simply lovely and which I had not realized they possessed. For anyone who can't afford a greenhouse this type frame is a boon and very satisfactory. Also it is economical to heat." Bruce Cutler in New Zealand observed that "Lithops will germinate in an unheated greenhouse in midwinter but that cacti very seldom do. Providing you watch the watering of Lithops seedlings they can be sown quite thickly and kept stunted for years. This is a great help because you can prick them out when convenient. Cacti, sown too close become deformed and often rot off at the base. They need ample room to develop."

From Edna Cowan in Pennsylvania, writing in the C. & S. Robin No. 8, "What can beat the Christmas cactus for length of bloom and good display during the winter? Nothing I know of." Lib Swain in Massachusetts remarks, "I know Haworthias may be a bit stodgy—but they are so neat and clean and unfussy, and they send out their long flower stalks with pride and the slightest encouragement as if they were parents of orchids. I just can't help but admire them. As I look about my living room windows—bay with succulents, bay with cacti—I love to study the infinite number of contrasts in foliage patterns and colors, examples of which I have tried to place side by side."

In the C. & S. Robin No. 9, Lavon Cleaver in California, has this to say about some neglected Mams. "I took them from the shelf where they were seldom watered and repotted them using a mixture of sand, oakleaf mold and more than a sensible amount of seed free steer manure. Then I put them under the lath and gave them a good drink when they were dry. Their color is the healthiest green you ever saw and they are growing like mad. One of my Mams. had a crusty, spreading, scaly band of yellowish something around the base. Now after repotting, feeding and more water the entire plant is the picture of health."

In International R. Robin No. 2, our English member, Edna Lord, mentions among other things a trip to southern Switzerland where "I was intrigued to see Opuntia pads growing on high walls and full of seed pods. Wish we could have seen them in bloom."

From International R. Robin No. 1, Joyce Hillmer, in New Zealand, is "putting her cactus 'family' to bed. From now on most plants will be getting less water. Last year I tried leaving the large ones without water throughout the winter, but I will not do it another year —they all will get some water. I found that they took too long to recover from the dryness, and it certainly did not make them flower any better. In fact, I doubt that they flowered as well." In the same Robin, Billie Marie Anderson, in Texas, tells of her Arizona Rainbow cactus in this way: "Last fall I got sorta regusted with that one foot tall, old Rainbow I have had since December 1951. Never a bloom or even a bud, just grew, a beauty. Each winter I've been very careful it wouldn't freeze. Last fall I was a bit crowded for space so I decided to leave Mr. Arizona outside to sink or swim. No protection whatever, and it even took the January deep freeze spell. Reckon it agreed with it—two buds on it now."

Returning to Robin No. 6, Aileen Campbell, in Colorado, relates a little of her trip to Arizona. She said, "I fell in love with the country. The desert just fascinated me. While we were there we visited the Arizona Botanical Gardens at Tempe, and it was really the highlight of the trip. They have about 300 acres dedicated to cactus. About 20 acres are intensively planted with cactus from all over the world. They had a lath house where they had the more shade loving plants. We spent about two hours there, whereas two months would be more like the time to see things properly. I didn't bring back any native plants as I understand there is a fifty dollar fine for destroying desert life and I figured fifty dollars would go a long way towards buying some of the plants I really wanted."

Thus we take leave of the Robins for this time. Remember to write to me if you would like to join a Robin. Happy flying to all Robins.

(Mrs.) Gladys H. Panis,
P. O. Box 705, Falmouth, Massachusetts

K. I. O. CACTUS CLUB 1957

Our meeting room is in the Irwin M. Krohn Conservatory, Eden Park, Cincinnati, and an occasional meeting at the home of a member. Our club has been showing signs of new growth this past year and we have taken in five new members which has brought our membership back to twenty-four.

This year we have had several sound movies from the films of the Cincinnati Public Library, a botanical lecture by Dr. Meugel of the University of Cincinnati, three-dimentional pictures of cacti in Mexico by Mr. Harold Stout, and a sound travelogue given by Mr. Harold Moore.

We have been reviewing Mr. Marshall's study lessons on xerophytic plants for the benefit of our new members. As before, we have plant sales, plant exchanges, round table discussions, family type picnics, and an annual Chistmas party. Articles have been read from such publications as the Cactus Journal, Cactus Digest, Saguaroland Bulletin, Cactus Chronicle, Epiphyllum Bulletin, and items from newspapers.

Mrs. John Beretta, *Corr. Sec'y*
770 N. Crescent Avenue
Cincinnati, Ohio

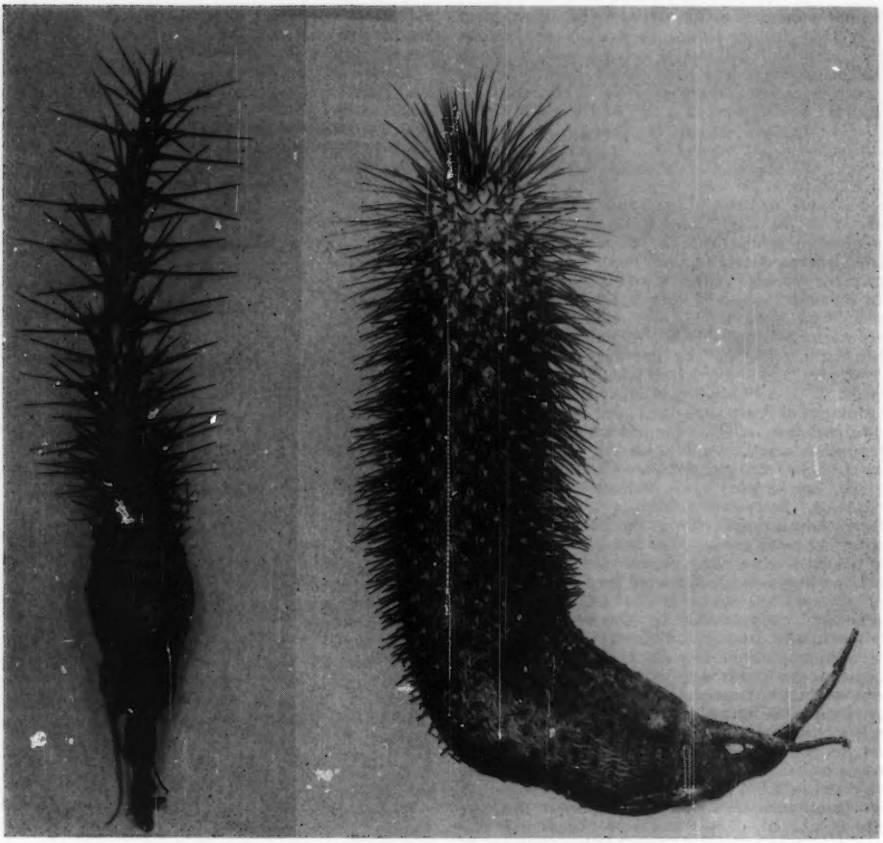


FIG. 88
(Left) *Pachypodium giganteum* Engl. Newly imported seedling 9 inches tall from Stellenbosch Botanic Gardens, sent over for the I.O.S. Congress Show in London in 1955. (Right) *P. namaquanum* Welw. Newly imported plant about 1 foot high. The root is often twisted owing to the plant's preference for steep rocky escarpments. L. S. Clarke photos.

Pachypodium – 'Cactus' of the Old World

By GORDON ROWLEY

Few could be blamed for mistaking the plants illustrated here for cacti. The prickles arise in threes from raised tubercles on the massive fleshy stems and look remarkably like cactus areoles. Yet these are African plants of the Periwinkle family (Apocynaceae), quite unrelated to the better known Cactaceae of the New World.

Although nearly twenty species of *Pachypodium* have been described, they are hardly ever seen in succulent collections. This is a great pity, for they are curious and beautiful, especially when the stem is crowned with a rosette of bright green fleshy leaves during the growing season. About half the species are Madagascan, so require more warmth in winter than the average succulent house provides. The remainder come from South or South-West Africa and stand a better chance of success, although imports are not always able to survive the damage to their roots in digging them up.

P. namaquanum, the most cactus-like of all, forms columns and candelabras up to and over 8 feet in height. A landscape covered with them recalls a forest of Sahuaros on a smaller scale. Seedlings grow slowly and small plants are unaccountably rare: Harry Hall says of one of his

collecting trips: "small ones are harder to find than diamonds, and we were lucky to find one." Further, they inhabit rocky ledges from which they have to be pried out with picks, so that casualties in transit are many.

This year *Pachypodium giganteum* flowered in Mr. Jacobsen's wonderful collection, perhaps for the first time in Europe. It would be of interest to know of any other records of *Pachypodiums* flowering in cultivation.

130 Whitmore Road
Harrow, Mdx., England

FIG. 89
Pachypodium giganteum Engl. The large, scented flowers produced perhaps for the first time in Europe in the Kiel Botanic Gardens, May 1956. H. Jacobsen photo.

Christmas Cactus

By MRS. ANNA M. FRANK

From the "Cactus Digest" of the Henry Shaw Cactus Society

The Christmas Cactus has always been one of my favorite house plants. As far back as I can remember, my mother always had a large plant in her house plant collection. As a child, I remember helping her carry it from room to room. We lived in the country and at that time there was no automatic heat in our homes like today. During the day, the cactus was kept in a sunny window and at night (when we had severe cold weather) the plant was put nearer to the stove so it would not be chilled. As soon as the weather would permit, the Christmas Cactus was set outside in a shady place to stay all summer. By the time it was to be taken in—which was usually about the first of October—the buds were starting to form and by Christmas it was a beautiful sight.

The blooming season of the plant gave the cactus its popular name. Some people referred to it as the "Crab Cactus" or "Lobster Cactus" and these names, of course, come from the shape of its flattened joints which have sharp teeth and prominent claws.

In our books, as of today, you will find it listed under the name of *Zygocactus truncatus*. Some cactus fans believe that the true Christmas Cactus is a *Schlumbergera*, and truthfully, I have never been able to understand the true differences between the two—at least not enough to write authoritatively about them. Today we have many plants that bloom anytime between October and Easter and so you will hear people using the name "Easter Cactus."

We only have a meager description of some of the early species that were introduced many years ago. I have read many books dealing with this plant, but no one could explain for sure why they bloomed at different times of the year.

We do know the plant is a true cactus with handsome red, sometimes double flowers which appear usually around the holiday season. We also know it as an attractive and easily-grown house plant. It has always been popular in collections ever since it was introduced into cultivation more than a century ago.

A common practice is to graft the Christmas Cactus on a more robust stock—usually an upright stem of a plant of the genus *Pereskia*. This results in a large bushy plant, very showy when in bloom. If cuttings of this plant are inserted a few inches apart in a pot of sand or soil, they soon produce a thick graceful mass of foliage. This cactus prefers a richer soil than is needed for other desert plants.

I am not an expert on the Christmas Cactus, but I always manage to have one in my collection. Although right now I haven't got any, I will start one again this spring. I feel there is something missing when I am

without the Christmas Cactus. I might just as well tell you how I lost mine. Last year I found scale on my plant and as you know this insect pest likes to get underneath the branches. Although I sprayed the plant regularly, I didn't seem to control the infestation. When it was time to take the plant in, I destroyed it rather than risk to bring it in the house and contaminate the other plants.

The culture of the Christmas Cactus is very easy. Keep in mind it likes a somewhat rich soil. Keep it moist but don't let the water stand on the roots. See that drainage is adequate. Place your plant outside in the spring when cold weather has disappeared, preferably under a tree. Here the midday sun will not reach it. The plant should have good air circulation and rain will not hurt it; in fact, it prefers a slow rain. Fill the pot full of soil so that the rains will not stand in the pot to make it soggy.

The Christmas Cactus does not like to be moved around too much. Put them in a permanent place for the summer and when taken indoors in the fall, try and place it in a sunny window where it won't have to be moved around, but keep it from a door that is opened and closed constantly, as draft will have serious results. The Christmas Cactus should have a rest period in early fall and another in the spring, right after it is through blooming. The plants need not be transplanted often. Leave them in the same pot for several years—unless the plant has outgrown the pot, then it should be transplanted. You may give it plant food while buds are forming and at that time start giving it more water. Don't let it dry out completely.

For my soil mixture I use about two parts of compost, one of sand, one of peat moss, one-fifth old cow manure crushed fine. I have been told by nursery people, and I also read in different books, that if you have trouble with your plants not blooming, or if your buds fall before they open, it could be caused by not having a rest period, or having your plant in a drafty location, or being moved around too much. The plants seem to like to stay put. I have tried to follow this as much as possible and have had very good success.

Last year was the first year I ever had trouble with insects on my plants. I have been told that insects like this plant and if you don't watch for them closely, the whole plant will get infected badly. The scale particularly likes to get in between the joints and it is hard to get at them with a spray.

Now all of you who own a Crab or Lobster Cactus, that is what we should really call the true *Zygocactus truncatus*, you will find that it very seldom blooms right at Christmas time. I hope you all try and follow my experience. I think you will succeed in having flowers, just when is hard to surmise, but I know they will come. Personally, I have found that when the plants have to be taken indoors there may still be many days of nice warm weather. Open the windows and let your plant enjoy some of the fresh air. In this way the plant will acclimate itself much more readily to the surroundings. This applies to all house plants, especially of the leafy kinds.

BOOK REVIEWS

Descriptiones Cactacearum Novarum, by C. Backeberg; 36 pp., no illustrations; Gustav Fischer Verlag, Germany, Dec., 1956. Available from Abbey Garden Press $2.00.

In the next year or two Backeberg is issuing a 3-volume monograph of the Cactaceae, and the present booklet is intended to validate most of his new taxa, which, it is claimed, will be more fully described in the larger work. As over 300 taxa are published in this booklet it is of great importance to those concerned with the taxonomy of cacti. About 200 of the species were collected in Feru by Dr. Werner Rauh of Germany, while the remainder are from various sources in other countries or are older species here validated for the first time. The descriptions are entirely in Latin.

The work will probably always be regarded as a curiosity of botanical literature, for here the customary low quality of Backeberg's work sinks to a grotesque level. Indeed it could well be used as a classroom example of what the conscientious taxonomist should avoid in his own work. In the first place he has employed questionable ethics in publishing a number of Rauh's collections which he knew had been collected earlier by Johnson, Ritter and Akers and which he also knew the latter were planning to publish. Secondly, he seems to have described every minor variation so that, for example, we are confronted with some 20 new *Haageocereus* species from one river-valley in Peru! The descriptions are ridiculously short and he fails to mention how the new species differ from one another and from older species. The result is that practically none of his new taxa are established as being actually distinct. The citation of type localities is superior to that usually found in Backeberg's work because these data were furnished by Dr. Rauh, who, as is obvious from some of his own recent articles on cacti, is a much better scientist and who probably now regrets that his collections ever got into the hands of Backeberg.

It can be imagined what the effect of these 200 newly published, but inadequately distinguished, species will be on the revisions of Peruvian cacti now in progress by different workers. Their task has been difficult at best, due to the amateurish manner in which most of the older species were published. Now that confusion, for which Backeberg was also largely responsible, has been fantastically multiplied.

MYRON KIMNACH

Die Kakteen; edited by H. Krainz with the collaboration of Prof. Dr. F. Buxbaum and W. Andreae; a quarterly illustrated publication of 32 pp.; Franckh'sche Verlagshandlung, Germany, 1956. ($2.00 per year from Abbey Garden Press. Loose-leaf binder $1.50).

This is a quarterly publication, written in German, which describes and illustrates cultivated species of cacti. The several parts so far issued consist of an excellent review by F. Buxbaum of the morphology of cacti, an outline of his systematic division of the family, separate generic treatments which give both original and modern, detailed descriptions, as well as comments on morphology and phylogeny, notes on cultivation, and bibliographies. Two pages are devoted to each species and a loose-leaf binder is furnished so that each may be kept in alphabetical sequence. There are many first-rate photographs, often in color, and meticulous drawings by Buxbaum.

There are some minor faults. Buxbaum's suprageneric taxa, although more natural and useful than any previous ones, are still merely *nomina nuda* as used here, the paper which is to validate them still being in press. The magnification of the illustrations is not indicated and can be roughly determined only by comparing them with the descriptions. The earlier pages were neither numbered nor dated, and the present practise of only dating a page is inadequate to allow its citation as a reference. There is little else with which one can find fault, and the authors are to be congratulated on the quality of their publication.

Although it is unfortunate that an English-language edition is not available, we highly recommend this work even to those who do not read German, if only for the fine illustrations.

MYRON KIMNACH

SPINE CHATS

LADISLAUS CUTAK

Although William Taylor Marshall had been in ill health for several years his sudden death on August 25th last was a shock to most of us who knew him well. Bill Marshall was director of the Desert Botanical Garden of Arizona in Papago Park for the past eleven years. He was born in Philadelphia, Pa., in 1886 but went West when he was about 20 years old. He worked at various jobs—bank clerk, salesman, and interior decorator before he assumed the directorship of the Garden in Phoenix. Many years ago his daughter presented him with a gift package of five cacti and that started him on a career which brought him to the top as an outstanding cactus authority. His caustic remarks and criticisms often irritated his colleagues and I myself did not always support his views but one thing we had to remember he was in love with his plants and devoted to his work. The national cactus society prospered under his leadership and during his regime the first cactus convention was organized in 1941. It was at that time I got acquainted with him personally and during my first visit to California in 1946 we made a memorable and exciting field trip together in the company of Gil Tegelberg and Scott Haselton. Bill Marshall leaves behind his wife, Therese, and two sons and a daughter. To them we extend our deepest sympathies.

From all reports, those who attended the last cactus convention in Berkeley had a marvelous time. Unfortunately, I could not be present and consequently broke my perfect attendance record. A number of factors prevented my presence this year, chief of them being the time element at an inopportune period. Lydia and I, with two of our boys, drove East and celebrated our silver wedding anniversary on a pleasant trip. Most of my former vacations combined business with pleasure but this one was definitely a pleasure trip. We did visit one of the nation's most important horticultural showplaces—Longwood Gardens, a few miles out of Kennett Square, in Pennsylvania. This wonderland originally was the estate of the late Pierre S. du Pont, a financier who had a passion for horticulture, architecture, music and other allied arts. He acquired Longwood in 1906 and transformed the thousand-acre preserve into one of the best known and best loved gardens in the world. There are vast areas of velvety green lawns bordered and dotted with various beds of sheared hedge and cubed trees, among which fountains spout and spray in playful mood, creating an artistic spectacle second to none in the United States. The main fountain display is located in front of the garden conservatory terrace and the water is supplied from a 50,000 gallon reservoir sunk in the wooded hilltop. On certain nights in the summer multicolored lights play upon the plumes of water which rise in streams or spread into misty, fanshaped sprays. Although fountains and pools play such an important role in the getup of Longwood, there is also a conservatory with a labyrinth of hothouses covering an area of nearly three acres. The main room can be transformed into an indoor theater or banquet hall. Here Bougainvillea blooms high above the stage in the background, Australian tree ferns line the sides, and beds of exotic flowers brighten up the indoors even when blustery winds blow outside and snow covers the ground. From the main conservatory acacia-bordered corridors and fern passageways lead to lesser houses where an array of botanical material is assembled. The visitor is ushered to the cactus house where desert plants of all sizes and shapes are grown. As yet, the collection is relatively small but it will be enlarged considerably. I am glad Director Russell J. Seibert is not overlooking this interesting group for cacti and the other succulents have assumed a rightful place in horticulture. Cactus fanciers in the East are assured of another worthwhile collection at their doorstep for Longwood is within easy driving distance of such metropolitan areas as New York, Philadelphia, Baltimore and Washington, D. C.

Visitors to our Nation's Capital often do not realize that a botanical garden of note exists within the shadow of the classic Capitol building. Back in 1937 I had my first glimpse of this institution and naturally had to visit it again on this Eastern trip. Like all botanical gardens it has a charm of its own and I enjoyed this second visit even more than the first. Two rooms are given over to desert plants—some in tubs and others set out in beds and rockeries. The collection may not rival California displays but is extremely interesting to people who don't get the chance to travel beyond the Mississippi River. If any of you have never paid a visit to either of the above gardens place them on your 'must' list next time you are in the vicinity.

Robert L. Dressler has published a valuable treatise on the Genus Pedilanthus in Contributions from the Gray Herbarium of Harvard University, No. 182 (1957). The last revision of Pedilanthus was that of Millspaugh in 1913. Pedilanthi are curious succulent plants usually cultivated in conservatories and tropical gardens, characterized by the strangely formed inflorescence resembling a slipper. Thus the common name, Slipper Spurge, originated for this group. Doctor Dressler recognizes fourteen species and arranges them in five interrelated species groups. In 188 pages he discusses the history, economic value, morphology, distribution and evolution, as well as biotic relations of the Slipper Spurges and illustrates them with charts, halftones, line drawings and distributional maps. Dressler describes two new species, *P. gracilis* and *P. pulchellus*. The first one is related to *P. calcaratus* but distinguished by a number of details. The second likewise resembles *P. calcaratus* in habit and the form of the cymes and he considers it of major phylogenetic interest because it provides a better link between *P. tithymaloides* and the remainder of the genus. Since *Pedilanthus tithymaloides* is the most widely distributed and variable of the Slipper Spurges, it is the only species in which clear geographic populations of subspecific rank are found. He lists and describes eight of its subspecies including *tithymaloides, parasiticus, smallii, retusus, padifolius, angustifolius, bahamensis* and *jamaicensis*. Plants which appear to be hybrids between different subspecies are also discussed.

Dr. H. W. DeBoer describes a new species of Lithops from the Cape Province in the July 1957 issue of Succulenta. He calls it *Lithops hallii* and honors the collector, Dr. H. Hall, who discovered it 30 miles from Prieska. It is allied to *L. turbiniformis*, but is smaller, light brown and with a white flower.

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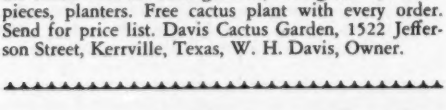

TWO NEW BOOKS

Within the next few weeks we may expect copies of Vol. 2 by Marsden "Mammillarias". This will be a "quick reference manual on names, classification, habitat, form, color, spines, flowers, and most important of all—detailed cultivation." The price will probably be about $3.50. Marsden's first book was "Grow Cacti" which was an introduction to the specialized books that will follow as a series. (Both books may be ordered from Abbey Garden Press).

Edgar Lamb has a new book on the press "Stapeliads in Cultivation" which contains "just the information you require for success in growing these fascinating plants. Over 100 pages of photography including some lavish color pages." Price may be around $6.75.

"Dictionary of Genera and Sub-genera of Cactaceae" by R. S. Byles. Revised from The National Cactus and Succulent Journal to Feb. 1957. This 36-page book lists all the generic names of cacti and indicates: (1) if they are nomina nuda; (2) if the genera and sub-genera are unacceptable and the reasons; (3) genera and sub-genera effectively published and where when and by whom, together with a brief description. This is a must for any student of cacti. Postpaid $1.00

SUKKULENTENKUNDE VI

Part VI dated Jan. 1957, has just been made available. This Swiss year-book of 64 pages is in German and is a necessity for the cactus reference library. One of the feature articles is on Peruvian Cacti by Werner Rauh with 13 photos. This issue will be reviewed in the next issue by Myron Kimnach. In the meantime it is available for $2.50 from Abbey Garden Press. The five earlier parts are still available for $6.00.

OUR PRESIDENT'S NEW TEXT BOOK

Dr. Lyman Benson, President of the Cactus and Succulent Society of America, is the author of "Plant Classification" just published by D. C. Heath and Company. It is unbelievable that so much information can be packed in its 700 pages. The features may be briefly summarized: 1. Terminology is technical but restricted to essential words; illustrated. 2. Basic morphology is described, illustrated, and evaluated for each group of vascular plants. 3. Recent literature is taken into account in formulating a new system of classification of vascular plants. 4. Geological history interprets living plant groups in the light of the past whenever the evidence is significant. 5. Botanical history with an analytical approach emphasizing trends and ideas rather than names, details, and dates. 6. Workable keys for the divisions, classes, orders, and families of vascular plants. 7. Detailed illustrations by J. D. Laudermilk take about 150 pages plus a great many valued drawings by the author. Whether you wish to learn how to prepare herbarium specimens, trace the evolution of plants through the geological periods to the present day, learn the association of species, study the vocabulary for flowering plants—it is all in this one volume. How a busy man can record so many valuable facts in one life-time is beyond comprehension. We are fortunate that Dr. Benson is an authority on cacti and has therefore recognized this group of plants in his latest book whereas many botanists have avoided them in the past. "Plant Classification" ends with a glossary of common and technical terms and a complete index. The book is available from the publishers or through Abbey Garden Press for $9.00. (California buyers please add 4% sales tax).

CALIFORNIA CACTUS

This will announce that this book by E. M. Baxter is sold out and no more copies are available.

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NEW MAGAZINE

June 1957 was the date of Vo.l I, No. 1 of the Official organ of the Cactus and Succulent Society of N. S. W. It has the same name as our Journal: "Cactus and Succulent Journal" (the bibliographers will enjoy this). The quarterly magazine is neatly printed and contains 12 pages and covers. Written for the amateur growers, it is packed with just the information that a beginner likes to read. The subscription price is $3.00 per year, mailed to the Secretary, Mrs. O. Griffin, 1 Robinson Lane, Woollahra, New Zealand. To help along this new publication we give them permission to reprint from our American Journal.